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FEATURES

Y2K Easy Rider Karl Feilder:
Why time is not on our side
Is Gates a sociopath?
Tech stocks: Road pizza
feeding frenzy

FIRST TAKE

WordPerfect Office 2000

HP Jornada 820: Hot new
tray-top CE PDA

Olympus C-900 Zoom:
Pioneering digital camera

Toshiba Portégé 3010CT:
Sleek and light

Gateway GX-450 PII Xeon

WORKSHOP

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Newbie networking
- Step-by-Step: Avoid
hardware heartache
- Windows: Tune-up
and customisation
- **Plus** OS/2 voice recognition,
Mac OS latest system
updates and dynamic Web
content under Linux

On this month's software-packed CD

- Mass deletion: 13 top
uninstallers to free up
disk space
- Back to school: Kids can
learn and have fun at the
same time with these
educational programs
- Windows 95: Tuning and
tweaking for comfort
- GameZone: Grim Fandango,
H.E.D.Z., Johnny Herbert's
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Trespasser

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02

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300 MHz

Dell® Inspiron® 7000 with a 15" screen
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With options available up to a 15" screen, 8GB Hard Drive, 384MB SDRAM and Intel® Pentium® II processor 300MHz, the Dell® Inspiron® 7000 is more like a desktop than a mobile notebook. It could be the only PC you need as it also features an 8MB Video Controller, HW Wavetable 3D surround sound and 2X DVD-ROM. For extra mobility there's also the Inspiron® 3500 range – heavy on performance and features but light on price. No wonder PC World™ readers in Australia voted Dell® Inspiron® the joint best notebook of 1998. To order call 1300 303 107 or visit the Dell WebStore at www.dell.com.au

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or \$64 per week**

Upgrade options include:

- 192MB SDRAM \$240
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- 512KB L2 Pipeline Burst Cache
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- 4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- Microsoft® Windows® 98
- 56K Data/Fax Modem
- 1 Year Limited Warranty
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Upgrade options include:

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DELL® INSPIRON® 3500 D300GT INTEL® PENTIUM® II PROCESSOR 300MHz

- 512KB L2 Pipeline Burst Cache
- 64MB SDRAM
- 4GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 256-bit Graphics Accelerator
- High-fidelity Audio SoundBlaster Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- Microsoft® Windows® 98
- 56K Data/Fax Modem
- Deluxe Carrying Case
- 1 Year Limited Warranty
- Free Lifetime Telephone Technical Support

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Upgrade options include:

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- Microsoft® Windows® 98
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- 512KB Single Bank Pipeline Burst Cache
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- Turtle Beach Montego II 320 Voice PCI Sound Card
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DELL DIMENSION® XPS R450 INTEL® PENTIUM® II PROCESSOR 450MHz

- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 12.9GB Ultra ATA Hard Drive
- 16MB STB nVidia TNT 2X AGP Graphics Card
- Turtle Beach Montego A3D 64 Voice PCI Sound Card
- 40X Variable EIDE CD-ROM Drive
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DELL DIMENSION® XPS V400 INTEL® PENTIUM® II PROCESSOR 400MHz

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- 8.4GB Ultra ATA Hard Drive
- ATI® 8MB 3D 2X AGP Integrated Graphics
- Yamaha 64 Voice Wavetable Integrated Sound
- 32X Variable EIDE CD-ROM Drive
- Harmon Kardon HK195 Speakers
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- 3Com® USR 56K Capable V.90 PCI WinModem

DELL DIMENSION® XPS V350 INTEL® PENTIUM® II PROCESSOR 350MHz

- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- ATI® 8MB 3D 2X AGP Integrated Graphics
- Yamaha 64 Voice Wavetable Integrated Sound
- 4.8X DVD-ROM Drive and Software Decoding
- Harman Kardon HK195 Speakers
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
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\$2,779*

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- 1 Year Limited Warranty

- Free Lifetime Telephone Technical Support

DELL® INSPIRON® 7000 D300GT INTEL® PENTIUM® II PROCESSOR 300MHz

- 128MB SDRAM
- 6.4GB Ultra ATA Hard Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlast® Compatible
- 2X DVD-ROM Drive and Decoder Card
- 14.1" XGA Colour TFT Display
- 56K Data/Fax Modem
- Deluxe Carrying Case

DELL® INSPIRON® 7000 D300LT INTEL® PENTIUM® II PROCESSOR 300MHz

- 64MB SDRAM
- 4GB Ultra ATA Hard Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlast® Compatible
- 24X Variable CD-ROM Drive
- 15" XGA Colour TFT Display
- 56K Data/Fax Modem

DELL® INSPIRON® 7000 D300GT INTEL® PENTIUM® II PROCESSOR 300MHz

- 64MB SDRAM
- 4GB Ultra ATA Hard Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlast® Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- 56K Data/Fax Modem

DELL® INSPIRON® 7000 D266GT INTEL® PENTIUM® II PROCESSOR 266MHz

- 64MB SDRAM
- 4GB Ultra ATA Hard Drive
- 8MB ATI® RAGE LT PRO 2X AGP Video Controller
- High-fidelity Audio SoundBlast® Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display

\$6,239*

or \$52 per week**

- Upgrade options include:
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\$5,759*

or \$48 per week**

- Upgrade options include:
- 8GB Ultra ATA Hard Drive \$699
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\$5,369*

or \$45 per week**

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DELL® INSPIRON® 3500 D300GT INTEL® PENTIUM® II PROCESSOR 300MHz

- 128MB SDRAM
- 6.4GB Ultra ATA Hard Drive
- 256-bit Graphics Accelerator
- High-fidelity Audio SoundBlast® Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- 56K Data/Fax Modem
- Iomega Zip 100MB Internal Drive
- Deluxe Carrying Case
- Second Battery

DELL® INSPIRON® 3500 D266GT INTEL® PENTIUM® II PROCESSOR 266MHz

- 64MB SDRAM
- 4GB Ultra ATA Hard Drive
- 256-bit Graphics Accelerator
- High-fidelity Audio SoundBlast® Compatible
- 24X Variable CD-ROM Drive
- 14.1" XGA Colour TFT Display
- Deluxe Carrying Case

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- 512KB Single Bank Pipeline Burst Cache
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- Integrated 3Com® Fast Ethernet XL
- Integrated Ultra2/Wide and Ultra Wide SCSI Controllers

- Integrated Dual ATA-33 EIDE Controller
- Integrated SoundBlast® Pro Compatible
- 32X Variable SCSI CD-ROM Drive
- Dell® Mouse
- Microsoft® Windows NT® 4.0

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DELL PRECISION™ WORKSTATION 610 INTEL® PENTIUM® II XEON® PROCESSOR 450MHz (DUAL PROCESSOR CAPABLE)

- 256MB 100MHz SDRAM with ECC
- 18GB LVD SCSI Hard Drive
- NEW Evans & Sutherland Accel Galaxy 31 Graphics Card
- 21" Trinitron® Monitor (19.8" v.i.s.)
- 3 Year Limited Warranty (with 4 hour response on-site for first year)
- Free Lifetime Telephone Technical Support

PERFORMANCE GRAPHICS SYSTEM

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- 128MB 100MHz SDRAM with ECC
- 9GB LVD SCSI Hard Drive
- NEW Evans & Sutherland Accel Galaxy 31 Graphics Card
- 21" Trinitron® Monitor (19.8" v.i.s.)
- 3 Year Limited Warranty (with 4 hour response on-site for first year)
- Free Lifetime Telephone Technical Support

\$13,209*

or \$111 per week**

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- Intel® 440BX AGPset
- 128KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- ATI® 8MB 3D 2X AGP Integrated Graphics
- Yamaha 64 Voice Wavetable Integrated Sound
- 32X Variable EIDE CD-ROM Drive
- Harman Kardon HK195 Speakers
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- 3Com® USR 56K Capable V.90 PCI WinModem

\$2,639*

or \$22 per week**

- Upgrade options include:
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 - Altec Lansing ACS-495 Full Dolby® Surround Sound Speakers with Subwoofer \$174
 - Call for a complete range of upgrades

DELL DIMENSION® XPS V333c INTEL® CELERON® PROCESSOR 333MHz

- Intel® 440BX AGPset
- 128KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- ATI® 8MB 3D 2X AGP Integrated Graphics
- Yamaha 64 Voice Wavetable Integrated Sound
- 32X Variable EIDE CD-ROM Drive
- Harman Kardon HK195 Speakers
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- 3Com® USR 56K Capable V.90 PCI WinModem

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or \$19 per week**

- Upgrade options include:
- 128MB 100MHz SDRAM \$200
 - Altec Lansing ACS-495 Full Dolby® Surround Sound Speakers with Subwoofer \$174
 - Call for a complete range of upgrades

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DELL® POWEREDGE® 2300 SERVER INTEL® PENTIUM® II PROCESSOR 400MHz (DUAL PROCESSOR CAPABLE)

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- 512KB Internal ECC Cache
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- Standard Intel® Pro 100+ NIC
- Integrated Ultra2/LVD and Ultra/Narrow SCSI Controllers
- 32X Variable SCSI CD-ROM Drive
- 15" Colour Monitor (13.7" v.i.s.)
- Standard Openview Network Node Manager S.E.
- 3 Year Limited Warranty (with 4-hour on-site response for first year)
- Free Lifetime Telephone Technical Support

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DELL® POWEREDGE® 2200 SERVER INTEL® PENTIUM® II PROCESSOR 333MHz (DUAL PROCESSOR CAPABLE)

- Rack Mount Capable Mini Tower
- 512KB Internal ECC Cache
- 32MB EDO RAM with ECC
- 4GB SCSI Hard Drive (3 internal bays)
- 3.5" 1.44MB Diskette Drive
- Standard Intel® Pro 100+ NIC
- 32X Variable SCSI CD-ROM Drive
- 15" Colour Monitor (13.7" v.i.s.)
- Standard Openview Network Node Manager S.E.
- 3 Year Limited Warranty (with 4-hour on-site response for first year)
- Free Lifetime Telephone Technical Support

\$3,079*

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- Microsoft® Windows® 98
- McAfee Virus Scan

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- Free Lifetime Telephone Technical Support

DELL DIMENSION® XPS V400 INTEL® PENTIUM® II PROCESSOR 400MHz

- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- Integrated Intel® 10/100 PCI Ethernet Controller
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- 32X Variable EIDE CD-ROM Drive
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DELL DIMENSION® XPS V350 INTEL® PENTIUM® II PROCESSOR 350MHz

- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- Integrated Intel® 10/100 PCI Ethernet Controller
- ATI® 8MB 3D 2X AGP Integrated Graphics
- 32X Variable EIDE CD-ROM Drive
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NEW DELL DIMENSION® XPS V400c NEW INTEL® CELERON® PROCESSOR 400MHz

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- 128KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- Integrated Intel® 10/100 PCI Ethernet Controller
- ATI® 8MB 3D 2X AGP Integrated Graphics
- 32X Variable EIDE CD-ROM Drive
- 15" Colour Monitor (13.7" v.i.s.)

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- Upgrade options include:
- 17" Colour Monitor (15.9" v.i.s.) \$200
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DELL DIMENSION® XPS V333c INTEL® CELERON® PROCESSOR 333MHz

- Intel® 440BX AGPset
- 128KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 8.4GB Ultra ATA Hard Drive
- Integrated Intel® 10/100 PCI Ethernet Controller
- ATI® 8MB 3D 2X AGP Integrated Graphics
- 32X Variable EIDE CD-ROM Drive
- 15" Colour Monitor (13.7" v.i.s.)

\$2,029*

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- Upgrade options include:
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 - Iomega Zip 100MB Internal Drive \$150
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- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 128MB 100MHz SDRAM
- 14.4GB Ultra ATA Hard Drive (7,200rpm)
- 3.5" 1.44MB Diskette Drive
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- Turtle Beach Montego II 320 Voice PCI Sound Card
- 4.8X DVD-ROM Drive and Decoder Card
- NEW Altec Lansing ADA-880 Full Dolby® Digital Speakers with Subwoofer
- 19" Colour Monitor (17.9" v.i.s.)
- Logitech Mouseman® Wheel (PS/2v)
- Microsoft® Windows® 98
- McAfee Virus Scan
- 3Com® USR 56K Capable V.90 PCI WinModem
- Iomega Zip 100MB Internal Drive
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

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or \$45 per week**

Upgrade options include:

- 256MB 100MHz SDRAM \$399
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DELL DIMENSION® XPS R400 INTEL® PENTIUM® II PROCESSOR 400MHz

- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 128MB 100MHz SDRAM
- 14.4GB Ultra ATA Hard Drive (7,200rpm)
- 3.5" 1.44MB Diskette Drive
- 16MB STB nVidia TNT 2X AGP Graphics Card
- Turtle Beach Montego A3D 64 Voice PCI Sound Card
- 4.8X DVD-ROM Drive and Decoder Card
- Altec Lansing ACS-495 Full Dolby® Surround Sound Speakers with Subwoofer
- 19" Colour Monitor (17.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 3Com® USR 56K Capable V.90 PCI WinModem
- Iomega Zip 100MB Internal Drive
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

\$4,649*

or \$39 per week**

Upgrade options include:

- 17.2GB Ultra ATA Hard Drive \$60
- Turtle Beach Montego II 320 Voice PCI Sound Card \$80
- Call for a complete range of upgrades

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- Mini Tower Chassis
- 512KB Single Bank Pipeline Burst Cache
- 64MB 100MHz SDRAM
- 12.9GB Ultra ATA Hard Drive
- 3.5" 1.44MB Diskette Drive
- 8MB STB nVidia 3D AGP Graphics Card
- Turtle Beach Montego A3D 64 Voice PCI Sound Card
- 40X Variable EIDE CD-ROM Drive
- 17" Colour Monitor (15.9" v.i.s.)
- Microsoft® IntelliMouse™
- Microsoft® Windows® 98
- McAfee Virus Scan
- 3 Year Limited Warranty
- Free Lifetime Telephone Technical Support

\$2,829*

or \$24 per week**

Upgrade options include:

- 128MB 100MHz SDRAM \$200
- 19" Colour Monitor (17.9" v.i.s.) \$369
- Call for a complete range of upgrades

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- 4.8X DVD-ROM
- 320 Voice PCI Sound Card
- Dolby® Surround Sound speakers with Subwoofer

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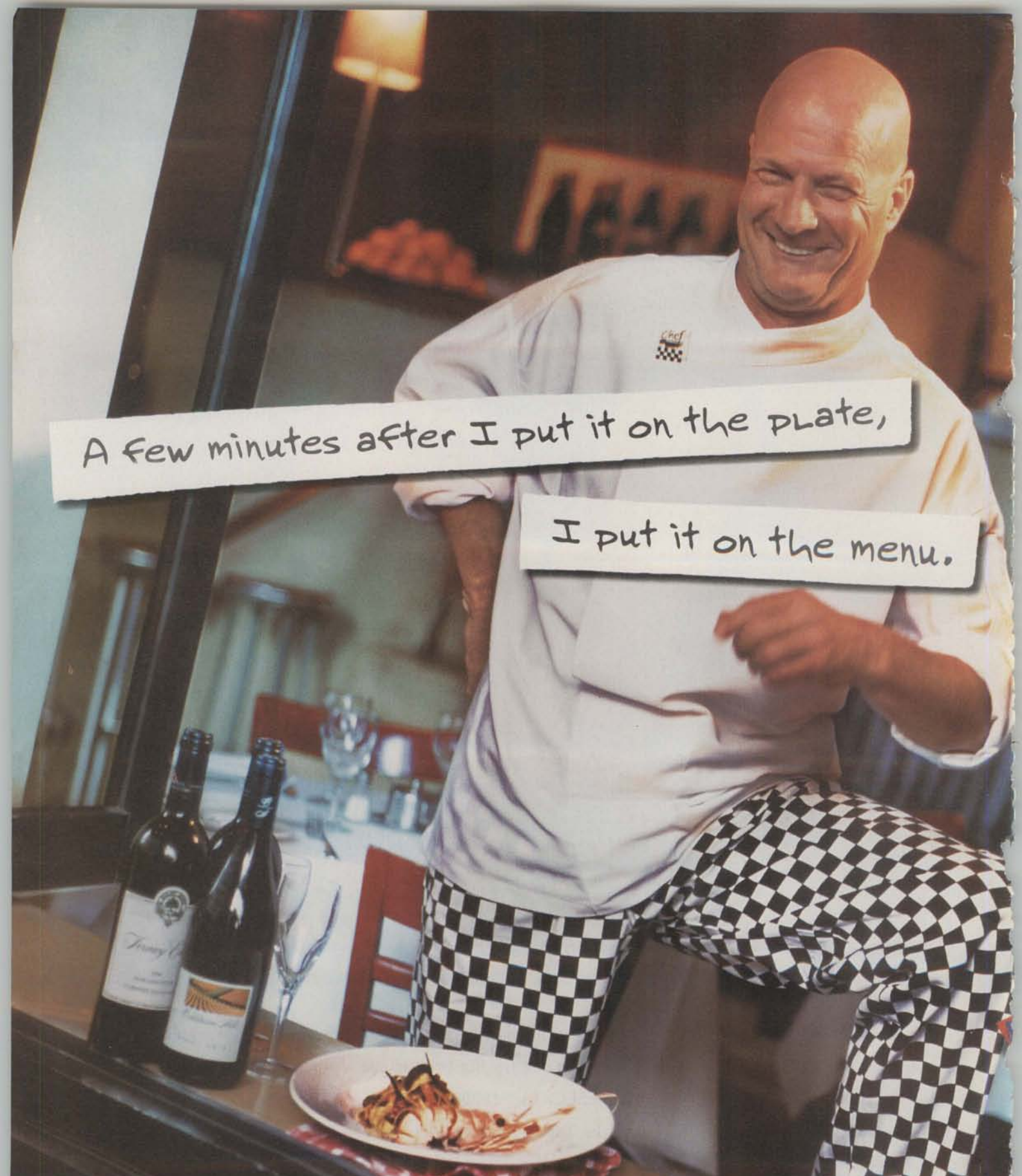
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Expanding Possibilities



The Santa photo

You know a technology is about to hit the mainstream when Santa Claus starts using it. In fact, the old guy with white beard and red hat has quite a tradition of being a pioneer.

By Jeremy White

As this column has noted previously, Santa Claus offers a lot of lessons for the IT industry.

Santa mastered long-distance air travel long before the rest of humanity, using flight powered by an environmentally friendly (reindeer-driven) form of propulsion. He has led the world in the efficient utilisation of low-yield agricultural land (the North Pole) for commercial purposes, created mass consumer advertising and marketing techniques (the Santa letter and stocking by the fireplace) that have been emulated effectively by toy retailers internationally, and he was even a leader in the employment of ethnic minorities (elves).

In an age where the highest of high-tech retailers — Amazon.com — still takes five or six weeks to deliver a book, and the simple announcement that it's opening a new warehouse quintuples its stock price, Santa is able to provide overnight delivery to the entire global population.

Indeed, the more you consider the issue, the more it seems clear that Santa Claus is probably the basis of the US and Australian stock markets' valuations of Internet companies. Consider his business model: he gives massive amounts of products away for free in an attempt to 'build value' in the Santa Claus brand, has posted significant losses every year of operation, and he runs a virtual company with limited physical presence but ubiquitous branding. But above all, even though there's no proof he really exists, you'd be surprised how many people believe in him. If he was to publicly list the North Pole with an IPO on Nasdaq, he'd make a killing.

I've always been in awe of Santa's approach. As I noted on this page a few years back, his market penetration of every household with children is something Bill Gates can still only dream about.

But Santa Claus is not only a great model for the IT industry and the US stock market. He's a closet technophile, and I think he makes a very good barometer for where technology will be taking us in the next year.

Wandering around the shops in the lead-up to this latest Christmas in a caffeine and crowd-induced haze, I found yet more evidence of how prepared Santa is to make effective use of new technology earlier than most of the rest of the population.

For years, a regular feature of Christmas life in the Western world has been the Santa photo. Parents take their children

been thinking for some time myself about getting a cheap but decent digital camera and new photo-quality printer, or perhaps a multifunction unit like the ones we review in this issue. So I've been keeping a close eye on the market and how it's been developing. Like most of our readers, I've been reading every review I can find and looking through every online store and sales catalogue I can get my hands on for pricing information. I've also been wandering around stores looking at samples.

As well as being a bit of a hobby, going through this acquisition process regularly is also a good reminder of what consumers

Santa's little helpers were using digital cameras with custom-designed high-end workstations and photo-quality printers.

up to their local retail establishment to see Santa Claus, and Santa recoups his costs by employing elf-like humans to take photos of the children sitting on his knee and then selling them back to the parents at a fiscally prudent margin.

This year, I noticed that old St Nick had gone high-tech. At almost all of the shopping malls and many of the individual department stores I visited, Santa's little helpers were using digital cameras with custom-designed high-end workstations and photo-quality printers.

For a small additional sum, you could not only get prints of children sitting with Santa, you could take away a floppy with a high-res TIFF, and get colour prints on the spot. Parents were queuing to get the floppies.

I think more than anything this is a real indication that a consumer age of digital imaging and printing has arrived. I've

face. Reviews are out of date almost as soon as they're printed, and there are wide variations in the discounts available on newer equipment.

If you haven't already played with digital cameras, scanners and photo printers, or some of the home-publishing products that have hit the market, they are well worth a look. As more people do the same, prices are only going to drop further, while feature sets become even more impressive. It's easy to forget just how far much of this technology has come. The idea of being able to buy a complete publishing system with desktop colour photocopying, good scanning and great colour printing for a street price under \$1,000 is revolutionary. And when even Santa Claus is using a digital camera for the kids' Santa photos, you know it's time to take a good look.

Oh, and don't forget that hot stock tip for North Pole Inc.■

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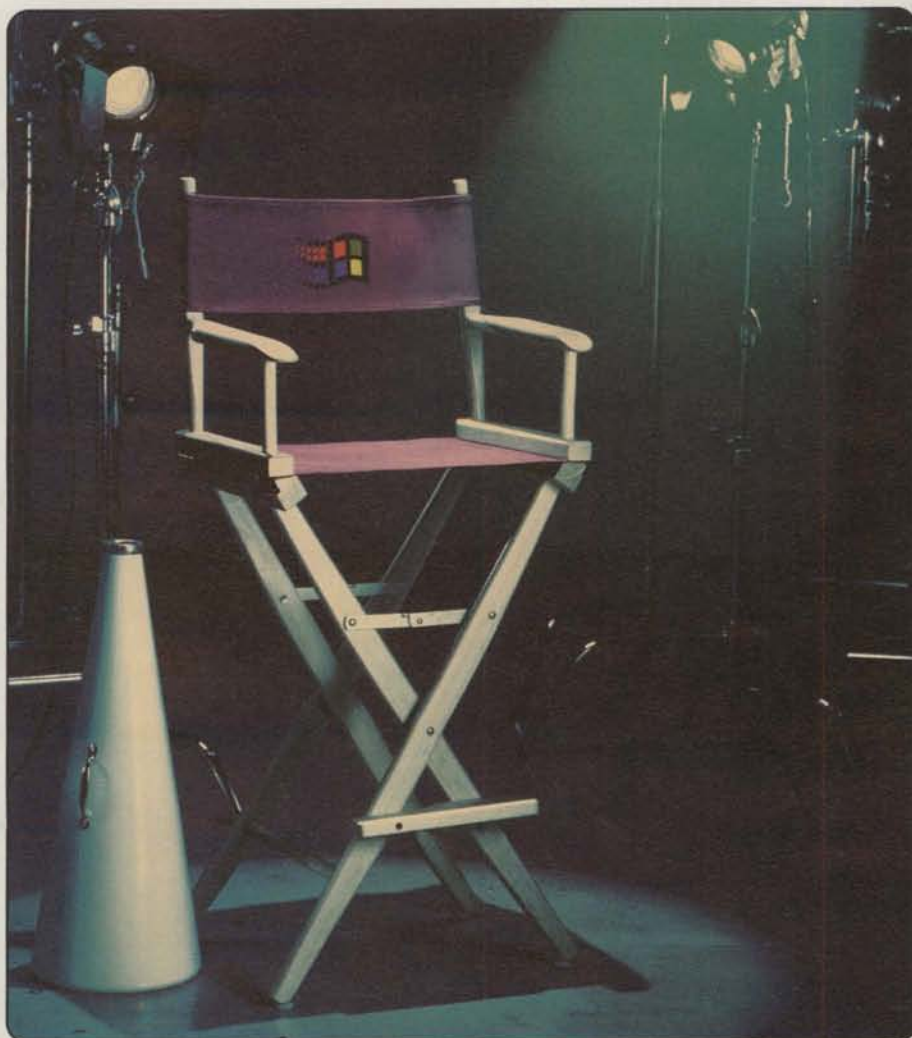
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Windows 2000 in the spotlight

Windows 2000, formerly NT 5.0, will ultimately unify the Windows 9x and NT product lines. Irrespective of whether it debuts this year or next, Microsoft has to get this one right in order to capitalise on the momentum created by previous iterations of its operating systems. We examine the features on show in Beta 2 of Windows 2000, including installation, usability, administration, Active Directory, plus some benefits for home users that have hitherto been missing from NT.

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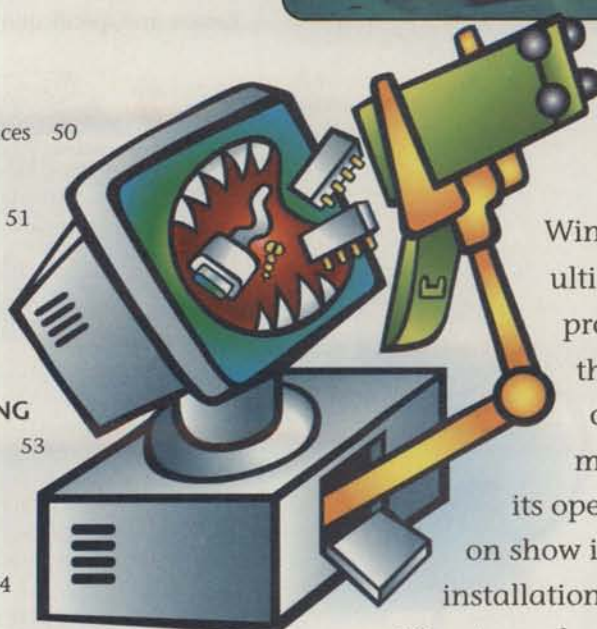
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Karl Feilder is known for his Y2K doomsaying and Harley-Davidson adventuring.

By Simon Vandore

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Behind the scenes at the Sydney Olympic Games, technology will play a leading role.

By Simon Vandore

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The Info2000 system is charged with providing accurate, up-to-date information to nearly 90,000 users.

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WINDOWS 2000: DOES IT DELIVER?

A lot is riding on Windows 2000, so we took a peek under the hood to tell you how it stacks up.

By Nathan Taylor

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By Darren Ellis

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By Jeremy Torr

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Brother MFC-6650MC

Brother MFC-7160c

Canon MultiPass C20

Canon MultiPass C50

Hewlett-Packard Officejet 710

Hewlett-Packard Officejet 1175C

Oki Okifax 5200

Panasonic KX-F1110AL

Panasonic UF-342AL

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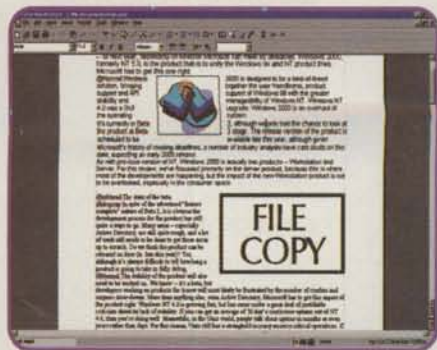
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The next generation
WordPerfect Suite 8.

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OLYMPUS C-900 ZOOM

A complex, semi-professional
digital camera.

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HEWLETT-PACKARD JORNADA 820

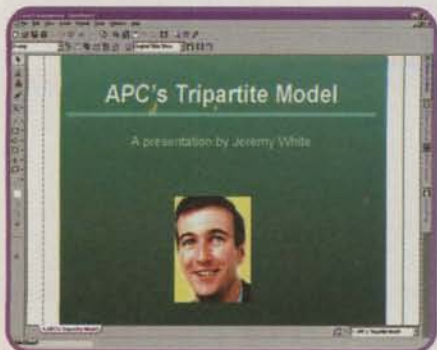
A well-designed vehicle for
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A sleek and light notebook.

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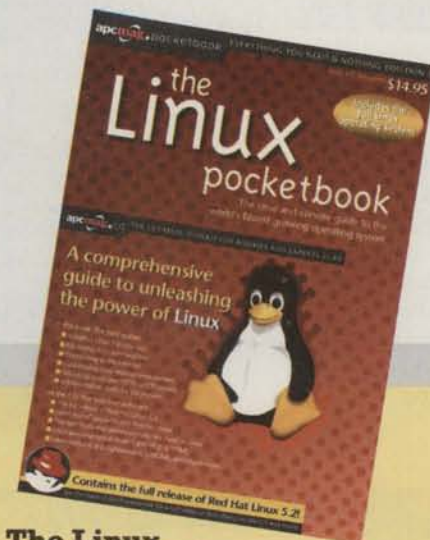
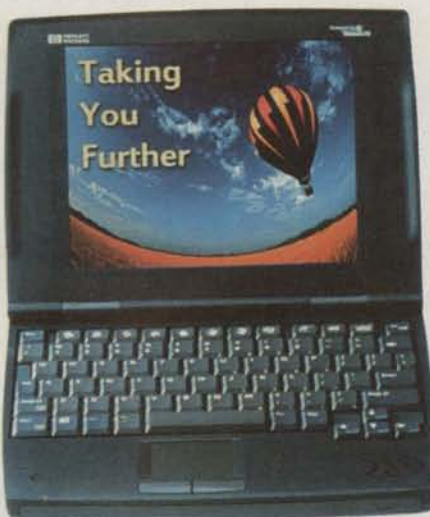
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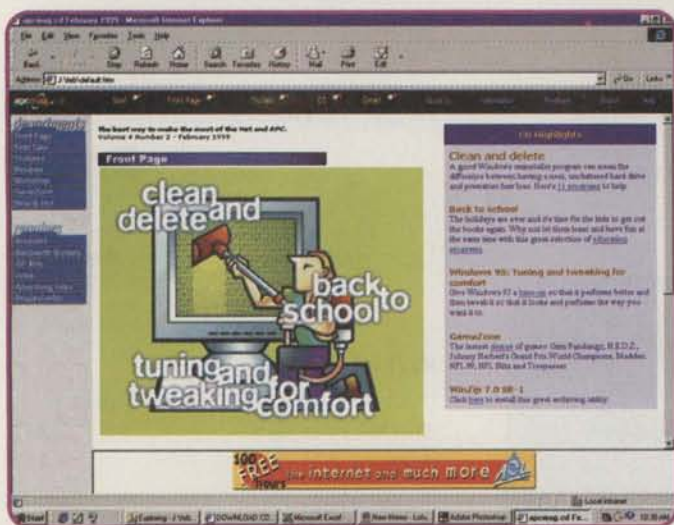
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This month on APC's cover CD



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Wintune 98, Power Toys, Kernal Toys, X-Setup, Windows Tweaking Toolkit, Star Menu Changer '97

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Windows Clickomania 3.0, Excalibur for Windows (32-bit) 1.05, Arachnophilia 3.9, Reptile (Repeat Tiler) 1.4, MINOS 2.2, QuickPhrase 1.1 OS/2 DragText 2.5, Desktop Wizard 1.41, NPS WPS Enhancer 1.82, Program Commander/2, X-File

Mac BEdit Lite 4.1, Synchronize 3.6.4, SoundApp 2.5.1, FinderPop 1.7.5, NetCD 1.5, ResEdit 2.1.3
Linux Tomsrftb, Gtksamba, Rsync,

XDaliClock, SDF

BANDWIDTH BUSTERS

Corel WordPerfect Suite 8 Service Pack 5

FIRST TAKE

Smith Micro Internet CommSuite

GAMEZONE

Grim Fandango, H.E.D.Z., Johnny Herbert's Grand Prix World Champions, Madden NFL 99, NFL Blitz, Trespasser

BROWSERS

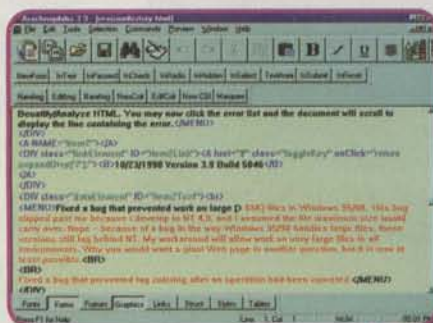
Microsoft IE 4.01 SP1, Microsoft Internet Explorer 4.0, Microsoft IE 3.03, Microsoft IE 3.02, Netscape Communicator 4.5, Netscape Communicator 4.08, Netscape Navigator 4.08

CLEAN AND DELETE

CleanSweep 4.0, Complete Program Deleter, Cybermedia Uninstaller, EasyClean 32 1.0.4, McAfee UnInstaller, RemoveR 1.75, Uninstall Manager 2.6, WINformant, Add/Remove 4Good 2.0, Add/Remove Pro 1.03, DirectX Uninstaller .09a

BACK TO SCHOOL

Astro-Mania 1.5, CDML Advanced Calculator 1.2, Crocodile Clips 3 Elementary 1.0, Dynamite Maths (Ages 5 to 7) 1.0, Grammar Expert Plus 1.3, Graph Paper Printer 2.41, Mathematics Worksheet Factory Lite 1.0.5, Ray's Spelling and Word Games (32 bit) 2.0, Ten Thumbs Typing Tutor 2.0,



ThinkAnalogy Puzzles: Level A (Grades 3 to 6) 2.1

NEW AND HOT

AutoZip 98 3.1, BulletProof FTP 1.10, Cyber-Info E-mail Notify 3.78, GJ Pacman, iInstall 3.0, Internet Angel 3.01, NetZip Deluxe 6.5, Planet.MP3Find 1.0, Reptile 2.0, WebPhone (Windows 95/98/NT) 4.02



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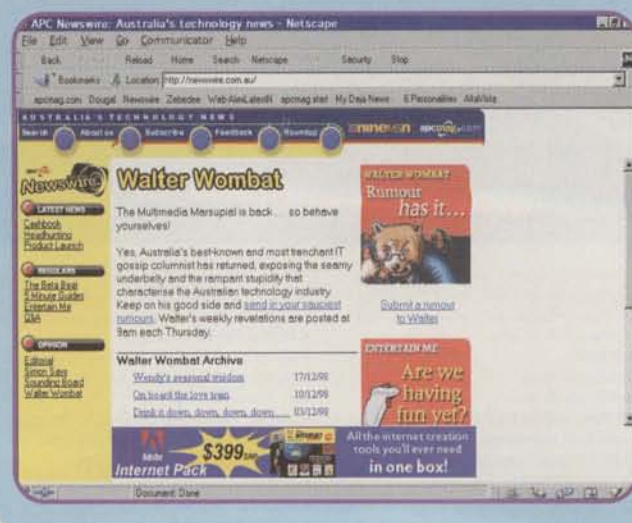
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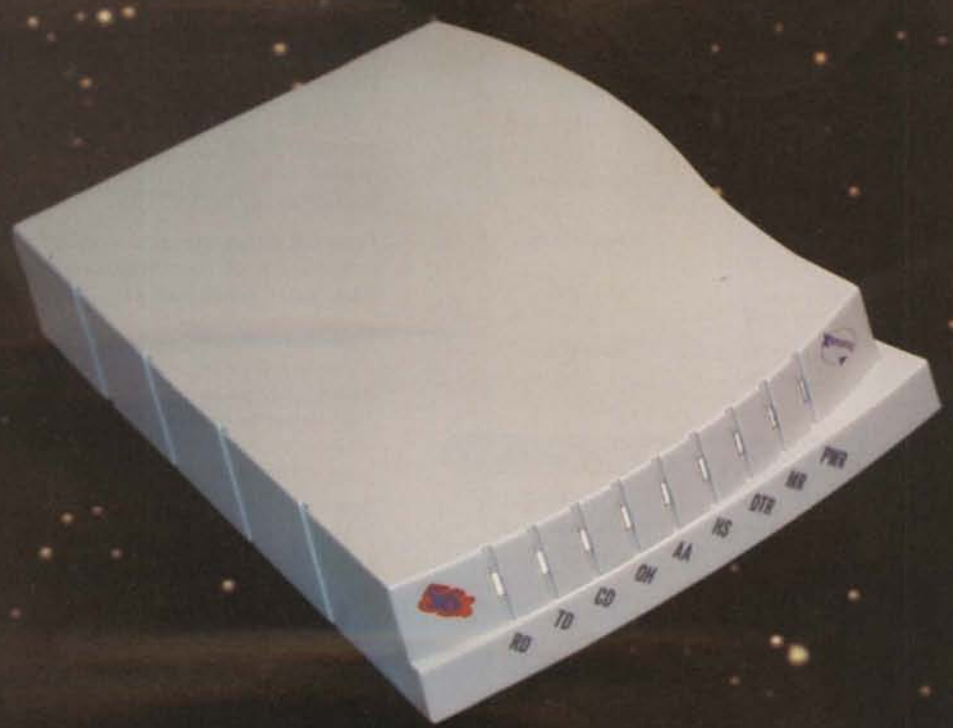

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Editor-In-Chief (02) 9288 9113	Jeremy White jwhite@acp.com.au
Managing Editor (02) 9288 9122	Richard Rodrigues rrodrigu@acp.com.au
Creative Director (02) 9288 9127	Darren Waldren dwaldren@acp.com.au
Business Development Manager New Media (02) 9288 9192	Matt Bateman mbateman@acp.com.au
New Projects Manager (02) 9288 9105	Helen Duncan hduncan@acp.com.au
Editorial Assistant (02) 9288 9123	Natalie Richardson nrichard@acp.com.au

EDITORIAL

Editor (02) 9288 9163	Helen Dancer hdancer@acp.com.au
Senior Editor (02) 9288 9125	Michele Roach mroach@acp.com.au
Senior Editor (02) 9288 9121	Steven Fear sfear@acp.com.au
Technical Editor (02) 9288 9175	Nathan Taylor ntaylor@acp.com.au
Senior Writer (02) 9288 9130	Simon Vandore svandore@acp.com.au
Canberra Correspondent 0419 211 483	Selina Mitchell smitch@acp.com.au
Melbourne Editor (03) 9823 6344	Stephen Withers swithers@acp.com.au
Technical Reviewer (02) 9288 9160	Josh Mehlman joshm@acp.com.au
Technical Reviewer (02) 9288 9115	Darren Ellis dellis@acp.com.au
Technical Assistant (02) 9288 9110	Claudius Kumar ckumar@acp.com.au

PRODUCTION

Chief Sub-Editor (02) 9288 9123	Kevin Pyle kpyle@acp.com.au
Sub-Editor (02) 9288 9126	Vanessa Richardson vrichard@acp.com.au
Sub-Editor (02) 9288 9177	Claire Waddell cwaddell@acp.com.au
Sub-Editor (02) 9288 9123	Glenn Phillips gphillip@acp.com.au
Artist (02) 9288 9190	Valery Soriano vsoriano@acp.com.au
Artist (02) 9288 9123	Niki Creed ncreed@acp.com.au
Web Manager (02) 9288 9152	Alex Kidman alex@acp.com.au

CONTRIBUTORS

Contributing Editors	Jeremy Torr, Dan Tebbutt
Contributors	Jeremy Horey, Bruce McCabe, David Nourse, David Braue, Michael Smith, Ari Weisz-Koves, Travis Simon, Gareth Jones, Daniel Rutter, James Morris, Christopher Relf, Kieran McNamee

NEWSWIRE

Editor (02) 9288 9172	Angus Kidman akidman@acp.com.au
Deputy Editor (02) 9288 9104	Roulla Yiacoumi ry@acp.com.au
Senior Journalist (02) 9288 9116	Josh Gliddon jgliddon@acp.com.au
Journalist (02) 9288 9161	William Maher wmaher@acp.com.au

CD TEAM

CD Editor (02) 9288 9109	Andrew Broadhead andrewb@acp.com.au
CD Coordinator (02) 9288 9110	Andrew Colley acolley@acp.com.au
CD Coordinator (02) 9288 9110	James Roberts jroberts@acp.com.au

POCKETBOOKS

Editor (02) 9288 9188	Ashton Mills amills@acp.com.au
Associate Editor (02) 9288 9132	Lindsay Hayman lhayman@acp.com.au

ADVERTISING

National Advertising Mgr (02) 9288 9120	Mark Harrison mharrison@acp.com.au
Senior Account Manager (02) 9288 9143	Sumit Roy sroy@acp.com.au
Senior Account Manager (02) 9288 9149	Alison Watson awatson@acp.com.au
Account Manager (02) 9288 9157	Justin Cain jcain@acp.com.au
Vic & Tas Sales Manager (03) 9823 6382	Julie Dominguez julied@acp.com.au
Sales Qld (07) 3000 8500	Noel Fitzpatrick
Sales WA (089) 481 4127	Diane Slade
Sales SA (08) 8212 9599	Sandy Shaw
Marketplace (02) 9282 8904	Morag Kerr
Advertising Production (02) 9282 8626	Peter Slingo

PUBLISHING

Group Publisher	John Alexander
Managing Director	Colin Morrison
General Manager Computer Publications	Michael Udabage
Group Sales Director (02) 9288 9158	David O'Sullivan dos@acp.com.au
Marketing Manager (02) 9288 9164	Stephen Dolan sdolan@acp.com.au
Marketing Projects Manager (02) 9288 9162	Heather Milley hmilley@acp.com.au

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Standard subscription rate:
Australia \$65 per annum.

Distributed by Network Distribution Company,
54 Park Street, Sydney, 1028.
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Australian Personal Computer is published by APC Computer Publications, a division of APC Publishing Pty Ltd (ACN 053 273 546)

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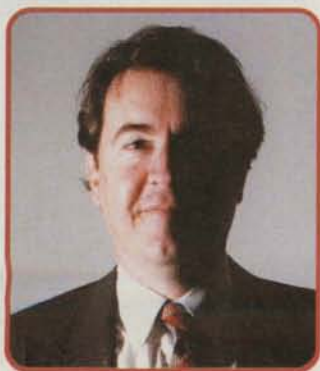
PROTOCOL FLOP

New links in telco scene

There's a brand-new look to the Australian telecommunications scene in 1999, as a number of major mergers and new regulatory regimes impact the increasingly Net-centric world of the major telcos. New mergers involving MCI, OzEmail, AT&T and IBM all point to renewed competition in the online space, and new reports and developments show Telstra's dominance of the local market is weakening.

In a move that surprised many, giant US telco MCI WorldCom has made a takeover bid for Australia's market-leading ISP OzEmail, offering \$US2.20 a share for the company in a deal that could be worth more than \$500 million.

In December, OzEmail announced that MCI subsidiary UUNet had purchased a 14.9% stake in the company, and had launched an offer for the remaining stock. Company directors Sean Howard (pictured), Malcolm Turnbull and Trevor Kennedy have recommended that the offer be accepted, provided a stronger bid is not



launched. Together, the three hold 54% of OzEmail's 146 million shares. The deal had not been finalised as APC went to press.

OzEmail's share price has soared in recent weeks on rumours of a takeover, but the most frequently named candidates have been AOL and Cable & Wireless Optus. The move is likely to signal a major shift in the Internet landscape, setting OzEmail's direction more clearly as a telecommunications company, and giving it new funding in its battles with rival Telstra Big Pond for market share.

Telstra recently claimed that its subscriber numbers had

Continued on page 20

\$US4.2 BILLION MEGADEAL

Contracts and salaries boom for IT workers

IT workers are exploiting the on-going demand for their services by turning more and more to contract work and reaping higher salaries, while the industry weighs up strategies to meet the shortage of skilled technology workers.

A recent survey by recruitment firm Drake International found that 11% of the national IT industry consisted of contract workers in 1998, well above the national average of 4% for all industry sectors. Furthermore, the study found that casual workers accounted for only 4% of the IT workforce, despite the national average increasing to 13% from 5% over the last five years.

The IT industry is one of the few sectors to avoid the trend towards casual and part-time work. Drake executive director Peter Renfrew said the boom in flexible staffing is not a new trend, and that the number of casual workers is growing at an annual rate of 20%. "Companies are now catering for

those peaks in their business cycle by opting for temporary and contract workers," he said.

Renfrew also suggested workers take precautionary measures to ensure they are able to cope with the sudden onset of contract work. "Treat everyone you work with as a potential client. Ensure you don't get their backs up as they could well be your future bread and butter," he said.

Whether or not IT workers will be as hard hit by this trend is another matter. With the looming threat of 200,000 unfilled IT vacancies in the next few years, local industry is preparing to tackle the skills shortage with a range of strategies, including a national marketing campaign and the development of a network for retraining workers interested in changing careers. The IT&T Taskforce, set up and funded by industry and representative associations, will coordinate strategies to tackle the skills shortage.

Continued on page 20



This month on NewsWire!

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New links in telco scene

Continued from page 19

overtaken OzEmail, long the market leader, for the first time. According to a report released by the Australian Communications Authority, the two companies together control 39% of the Internet market, and each has more than 150,000 subscribers. OzEmail itself claims a number closer to 250,000. OzEmail, which was started by Sean Howard, the founding editor of *Australian Personal Computer*, in 1990, only moved into the ISP market after an abortive attempt at creating its own proprietary email network.

In a second major merger deal valued at \$US5 billion, communications giant AT&T will acquire IBM's Global Network business.

Under the deal, which confirms longstanding rumours, both companies will also enter into mutual outsourcing contracts, worth further billions. IBM will outsource a chunk of its networking needs to AT&T, while AT&T has promised its applications processing and data centre management operations to IBM. The changeover is expected to take up to six months to finalise, and the new name of the acquired business has not yet been announced.

Such mergers are likely to impact heavily on a number of telcos, and Telstra will be the most obviously affected. According to the *Telecommunications Strategies Report 1997/98* by research firm Paul Budde Communication, Telstra will be the first national carrier in the world to lose more than half of its business to competitors. In contestable markets (national and international long-distance voice, mobile, and data), Telstra currently has a 52.5% share, which is expected to plummet to below 50% in 1999. But it isn't Telstra's main rival Optus or the newly emerging players such as OzEmail/MCI which

are claiming this lost share — small service providers are set to control more than a third of this market by 1999.

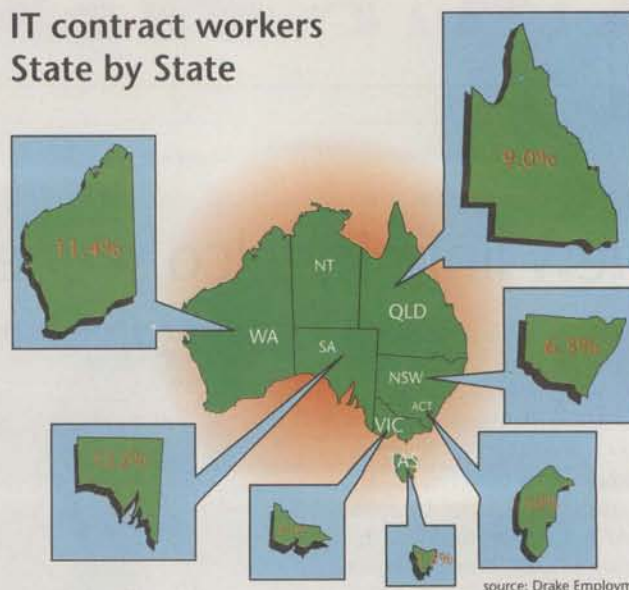
The Australian Competition and Consumer Commission's (ACCC) long-awaited announcement that it plans to declare access to the 'local loop' is also a welcome development for Telstra's telecommunications rivals.

The ACCC announced in December that it would be seeking a declaration — which means that it can intervene and set prices — on the customer access network of copper cable which connects individual users to their local exchanges. Because Telstra owns those local connections, it has been difficult for other telcos to offer a full range of services to rival those offered by Telstra itself. Telstra's competitors have been calling for declaration of the local loop virtually since the deregulation of the telecommunications industry in July 1997.

The local loop declaration should theoretically open Telstra up to much more rigorous competition, because all its rivals would be able to offer a full package of services (local and long-distance calls, plus Net access) on a single bill. In practice, though, the process could take some time, as demonstrated by ongoing negotiations over ISDN services. There seems no reason to assume that Telstra will be quick to offer a deal its competitors find acceptable — at the same time as the ACCC declaration, Optus announced that it was seeking arbitration on the related issue of interconnection, after negotiations had dragged on for more than six months. The declaration itself doesn't come into effect until February 15, and if Telstra can't reach agreement following that date, then the arbitration process could take even longer.

**Angus Kidman and
Roulla Yiacoumi**

IT contract workers State by State



source: Drake Employment

Contacts and salaries boom for IT workers

Continued from page 19

The shortage of workers in the Australian IT industry could reach 200,000 in the next few years, said Gerry Moriarty, Telstra's group managing director for network technology and multimedia and the convenor of a forum that discussed the issue at Parliament House in December. He said his involvement was motivated by self-interest: Telstra and other businesses are constantly grappling with the skills shortage.

Well paid

IT graduates still receive one of the highest starting salaries of any university students in Australia, a new study by the Graduate Careers Council of Australia (GCCA) has found.

The Graduate Destination Survey, conducted each year by the GCCA, found that computer science graduates who completed their studies in 1997 had the fifth-highest starting salary in 1998. This represents a slight improvement since the 1997 survey, which found that computer science graduates were earning the sixth-highest starting salary among local university graduates.

Despite this, educational

institutions have been criticised in recent months for failing to provide specific skills required in the IT industry. In November, Oracle executive Darren Rushworth said that a lack of specific training meant that it often took six months for a graduate to be productive in their first job.

However, IT salaries have continued to rise throughout the year, largely due to the continuing shortage of skilled IT workers in Australia. A survey released in August by the Australian Computer Society (ACS) found IT salaries rose by an average of 5.2% in the 12 months to February, with a median base salary of \$64,100. Private sector workers fared better, with a 6.2% jump in pay.

The GCCA report found that the gap between men's and women's starting salaries has also improved. According to the 1998 survey, the median salary for women was 96.8% of men's earnings. This has increased from 95% in 1997, and 91.7% in 1996.

The Graduate Destination Survey involved a survey of more than 97,000 new graduates in early 1998, with cooperation from several Australian universities.

**William Maher and
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GOVERNMENT CAVES

Privacy legislation

In a major turnaround, the federal government will legislate to control the use of personal information by business.

The Coalition Government has long opposed the introduction of specific privacy legislation for the business sector, arguing that the costs of compliance would be too high for many small firms. But there has been growing pressure in recent years for some degree of control of the use of personal information in the private sector, especially with the rise of networked computer systems.

Attorney-General Daryl Williams and IT minister Senator Richard Alston (pictured) jointly announced a plan in December to introduce 'light touch' legislation to ensure business does not abuse the privacy of individuals. The legislation will provide a basic framework in which all businesses must operate, but is not intended to override more specific business codes of conduct. Having a basic framework will boost confidence in e-commerce, Alston and Williams said.



The proposed federal legislation will adopt a similar model to that proposed in Victoria, which in turn is based on principles suggested by the Australian Privacy Commissioner.

It also includes a similar pattern of exemptions, which includes employee records and journalists' sources.

A spokesperson for Alston said it was hoped the legislation would be introduced in the first quarter of 1999, when Parliament resumes. "We

believe this is very important," the spokesperson said, emphasising that industry self-regulation was still the preferred model. Because of that stance, the legislation will not go through the same drafting and discussion phase as the Victorian legislation.

A Victorian government spokesperson could not comment on the effect national legislation would have on the Victorian plan. The Victorian Minister for Information Technology and Multimedia, Alan Stockdale, has previously stated that Victoria would abandon its legislation if a national model was introduced.

Angus Kidman

IT'S THE VISION THING

Sun unveils Java 2

Sun has announced sweeping changes to Java, including a set of new core features for the platform and a change to licensing models to make it easier for external developers to modify Java.

The newly announced Java 2 platform, which centres on Version 1.2 of the Java Development Kit (JDK 2), attempts to answer some of the criticisms levelled at Java in recent years, including poor performance, a lack of easy-to-access APIs, and concerns about Sun's ferocious control over the technology.

Key features of Java 2 will include improved application performance and support for plug-in virtual machines such as the forthcoming HotSpot technology, officials said. Java 2 will also sport an extended security model which offers policy-based control and certificate interfaces, and better support for international languages and disabled users.

To attract enterprise users, it also offers better CORBA support and extensions to provide easy access to mail, server and directory information. Those features are being implemented by a series of Standard Extensions, which aren't part of the core Java platform but can be easily added.

Despite the promised technology improvements, much of the early interest in Java 2 has focused on its new approach to licensing. Previously, companies that wanted to license Java source code had to pay a fee, and all modifications made to the code had to be returned to Sun for possible incorporation into the Java platform.

Under a new Community Source License initiative, developers can license Java for use in software development free of charge, and only pay for its use once those products are making money. Also, changes can be made to the Java source code without the code being returned to Sun for incorporation, and companies can exchange source code without intervention by Sun.

Sun officials have stressed that despite the new licensing arrangements, Java will remain under Sun's control. Companies that wish to develop new APIs for Java can do so provided they follow Sun-specified guidelines. The process will be audited by Price-waterhouseCoopers.

A range of new products will be rolled out by Sun over 1999 that leverage the Java 2 platform, including the NetDynamics application server (due in the first quarter) and the Hot-Java minibrowser (due Q2).

Angus Kidman



News Roundup

• A major government inquiry into bandwidth provision in Australia will examine the possibility that Australia will suffer a bandwidth drought over the next five years, as demands to use telephony and other networks for data continue to grow. The Australian Information Economy Advisory Council (AIEAC) will oversee the inquiry, which will be conducted by staff from the

Department of Communications, Information Technology and the Arts. The inquiry will focus on backbone communications services, both in Australia and internationally, rather than services provided directly to consumers. Investigators will need to consider the current network infrastructure, plans to extend it, and the likely demand for online and other services over the next five years. • Database giant Oracle and enterprise computing and cross-platform evangelist

Sun have announced a technology swap which appears to be designed to hit collective rival Microsoft where it hurts most: the operating system. The two companies have announced an integration of their key products that will essentially see Sun build a database-enhanced operating system, while Oracle will create an operating system-free database. Oracle will combine the core of Sun's Solaris operating system with its Oracle 8i database to create the foundation product

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CONSUMER BOON

PC industry cleanup

Owners of computer companies which go bust and then emerge later operating under a different name will have to show cause as to why they should be allowed to continue trading.

This is just one of the proposals to emerge from the Fair Trading Advisory Council's (FTAC) Inquiry into the Retail Supply of Personal Computers, Peripheral Devices and Software.

The council has made a series of recommendations to the NSW Minister for Fair Trading Jeff Shaw, strongly urging the tightening of both state and federal fair trading laws.

The recommendations include:

- The introduction of a national code of conduct;
- An alteration to the Fair Trading Act to contain a 'put up or shut up' power, forcing a trader to prove they can deliver on advertised offers. Refusal to comply would constitute an offence;
- The education of consumers to understand computer purchases and consumer rights.

Shaw said the inquiry found a large number of hard-

ware buyers were not computer literate. "This creates ideal conditions for unfair traders to exploit consumers," he said.

The inquiry began in May 1998 following a 246% increase in computer vendor complaints in 1997/1998. The FTAC was asked to consider the issues of defective machines, warranties, requests for large deposits, delivery problems, Y2K compliance, and unfair practices after a computer inquiry hotline found widespread dissatisfaction among buyers.

Since July 1997, five recalcitrant vendors have been named by the minister: Shop-sure (which had 450 complaints against it); Fairstar (220 complaints); Empire Systems (over 200 complaints); Forem-Freeway (over 300 complaints) and CNN Promotions.

The move comes as new figures suggest that Australia's love affair with the PC continues. "Over the next 10 years we can expect to see on average nearly two (1.8) computers in every home, as the computer becomes a major hub for communications, purchasing and entertainment," said ACNielsen interactive services manager Mark Henning.

Roulla Yiacoumi

SO MUCH FOR SAVINGS

Banks' costs soar despite ebanking

Although a phenomenal 80% of banks have adopted electronic banking, overall branch costs have blown out, a survey has found.

Electronic Banking in Australia, by research firm MINTEL, reports that despite the widespread take-up of the new technology, and the decrease in staff branches and bank staff, Australian banks have still recorded an increase in branch costs of 11% since 1994. During this period, the number of branches fell 17% and bank staff numbers shrunk by 22%.

"Cost savings envisaged by the banking system have been partly eroded due to the costly implementation of electronic banking channels that remain parallel to the traditional banking system," the report states.

The high use of paper-based payments, especially cheques, has also been a "significant cost" to banks.

In comparison with other countries, Australia was found to have the highest branch costs as a proportion of managed assets. The switch to

banks without branches — those which function entirely on the Internet or by interactive voice response (IVR) methods — has been greater overseas, particularly in the US.

But consumers are not happy. Recent closures, coupled with increasing bank fees, have driven "the development of a consumer neurosis and suspicion to changes implemented by the large banking institutions", according to the survey.

However, Internet users in rural Australia are taking advantage of the Web for banking and shopping despite previous concerns about service quality, another study has found. *The Australian Rural Internet Report*, released by market research firm APT Strategies, found that 18.1% of survey participants had used the Internet for financial transactions such as banking and shares. A national survey released by the ABS found that less than 1% of adult Australians had used the Net for banking.

Roulla Yiacoumi and William Maher



News Roundup

for its database server appliances, a project codenamed Raw Iron.

• The Australian Broadcasting Authority (ABA) and the Australian Competition and Consumer Commission (ACCC) have warned consumers that television sets which are able to receive digital transmissions are not yet available in Australia. The reason is that the technical

specifications for the digital television system in Australia will not be finalised until early this year. ABA chairperson Professor David Flint said there have already been many calls from concerned customers who have seen 'digital' televisions for sale. These sets can only receive analog signals, but use digital signal processing to create a better picture.

• APC swept the field at the annual Australian Information Technology Society (AITS) IT Writers Awards, taking home

three of the seven awards at the presentation in Sydney in December. Senior feature writer Selina Mitchell picked up the award for Best Feature Writer and shared the gong for Best Investigative Writer with technical editor Nathan Taylor. Contributing editor Dan Tebbutt won the award for Most Controversial Writer.

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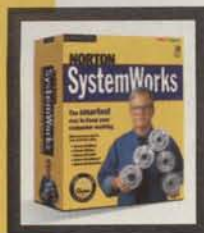
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MOUSE DISPUTES

Aussie company sues Microsoft

Peripherals developer Goldtouch Technologies has filed a suit against Microsoft, claiming the company's IntelliMouse Pro violates a number of patents it holds for ergonomic mouse technology. It also claims that Microsoft has stolen trade secrets from Goldtouch.

According to the complaint, filed with the US District Court, the IntelliMouse uses a number of technologies developed by company founders Mark and Elizabeth Goldstein. Goldstein, a former lecturer at the University of New South Wales, represents Australia in the International Standards Organisation (ISO) and is working on an ISO proposal for more ergonomic keyboards.

"Microsoft Corporation stole the Goldsteins' invention for itself, and used its market

power to divert to Microsoft profits to which the Goldsteins' business was justly entitled," the complaint filed by the company reads in part.

The key technology in dispute is the "optimal spatial relationships" between the location of the buttons on a mouse, which make the mouse more ergonomically friendly. The suit claims that while Microsoft's original mouse did not incorporate these technologies, the IntelliMouse does, violating patents filed by Goldstein in 1995.

The suit further claims that Microsoft officials learned of the proposal in October 1997, during a meeting to discuss a possible licensing of the Goldtouch design. Microsoft elected not to license the product at that time.

Angus Kidman

SPEEDING UP EXTRANETS

Overnet a new force

The Australian automotive industry is planning to link manufacturers and suppliers under a national IP network, creating one of the first 'overnet' implementations in Australia.

The Australian branch of the US-based Automotive Network Exchange (ANX) has already held talks with a number of ISPs about the plan. The ANX is a massive TCP/IP-based virtual private network linking automotive manufacturers with external suppliers and traders.

The Australian ANX (AANX) network will likely consist of a Web-based service to connect manufacturers and traders with external suppliers, as well as a private IP network to link major players such as Toyota, Ford, Holden and Mitsubishi. According to ANX representatives, the

network will also link the Motor Trades Association of Australia (MTAA), the Federation of Automotive Products Manufacturers (FAPM), and as many as 50 automotive importers.

The local automotive industry has been negotiating the possibility of national IP network for almost 18 months, the chairperson of the AANX committee,

Klaus Jahn, told **NewsWire**.

The ANX was initially established to provide major US car manufacturers with a single, secure network for electronic commerce and data transfer with their trading partners. This type of networking setup is increasingly being referred to as an 'overnet'. One study by IDC concluded that overnets were 225% cheaper to run than conventional wide area networks.

William Maher



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MICROSOFT REGISTRATION WOES

MS trials piracy add-on in Oz

Users of the forthcoming Office 2000 applications suite will be forced to register the product with Microsoft or be locked out of using it, under a new scheme that will be trialled in Australia.

Australian retail copies of Office 2000 will include a new Registration Wizard which aims to minimise the number of pirated copies of the suite. Customers can use the product 50 times, after which it will be disabled until the user registers and receives an installation ID number. The scheme is also being tested in New Zealand and Brazil, and it will be used worldwide if successful. The registration technology will be disabled in copies of Office 2000 purchased through Microsoft licensing programs.

Microsoft product marketing manager Drew Sharp said that while local piracy rates were low by world standards, Aus-

tralia was a good test market because it has similar characteristics to the US.

Previous attempts by Microsoft to collect registration information have resulted in controversy. The automatic registration feature in Windows 95, which can submit details of individual PC specifications if the user registers by modem, caused an outcry when the product was first released.

Hoping to avoid a similar experience, the Office 2000 registration process will only require the software registration number and the country in which the user resides. "Anonymity for some people is a very important issue, and we respect that," Sharp said. "There are certainly going to be some people who, no matter what we say, are not interested in giving Microsoft information about themselves." Microsoft will also conduct promotional campaigns to emphasise



benefits of registration, such as update notifications.

A final shipping date has not yet been set for Office 2000, but Sharp said the company is aiming for a release late in the first quarter of 1999. Office 97 was released in Australia almost a month before its US debut; Sharp said that this might happen again if local manufacturing can be organised.

Angus Kidman

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As millennium bug preparation hits its most critical phase, evidence suggests there's still a long way to go.

Facing the Y2K monster

Despite endless hype, massive advertising campaigns and a growing market for tools designed to fix the problem, new research indicates many Australian companies are still not prepared to deal with the millennium bug, paving the way for a possible mass failure of computer systems.

While 85% of Australian businesses have expressed "significant concern" over year 2000 (Y2K) compliance, only 13% have actually completed their preparations, according to an Ernst & Young report, *An Australian View of Risk Management*. The accounting firm surveyed more than 260 of Australia's top 2,000 businesses and found the Y2K problem was the most pressing risk-management issue.

Terry Richards, national director of business risk consulting at Ernst & Young, said over 70% of businesses were simply relying on letters of assurance from suppliers regarding Y2K compliance. "While the countdown to the new millennium is well under way, a significant gap continues to be identified between concern and completion of Y2K preparation," he said. "The dependence upon less-than-concrete assurances from suppliers raises further concerns as to the potential for critical disruption to business."

In further disturbing results, preliminary figures obtained from the Australian Bureau of Statistics' Y2K survey, which was conducted in October 1998, revealed that only 13% of businesses had developed a contingency plan designed to deal with Y2K-induced problems. The survey also revealed that only 20% had sought assurance from suppliers, service providers and customers about their Y2K preparations.

"Embarrassment should be used as an effective tool against businesses that haven't made effective Y2K plans," said CEO of the government's Y2K Strategy group Graeme Inchley.

The survey revealed Australia's 700 utilities are better prepared than the majority of Australian businesses, especially in the critical supply chain and contingency planning areas. Eighty-six percent of utilities had embarked on Y2K preparations, while 53% had put in place contingency plans, and 39% initiated supply chain rectification. In comparison, an

average of only 57% of all Australian businesses had undertaken Y2K work, 13% had put contingency plans in place, and 20% had received supply chain assurance.

Maurice Newman, Y2K Strategy chairperson, said that small business continues to be a concern, as 48% of microbusinesses (those with four or fewer employees) and 27% of traditional small businesses (under 20 employees) had not undertaken Y2K preparations.

The problem is not exclusive to small businesses. A survey of 2,200 Australian company directors found the fear of litigation over potential Y2K problems is a significant concern. *The Millennium Bug*, by the Australian Institute of Company Directors (AICD), found apprehension about litigation had grown to 38% in 1998 from 23% in 1997.

Over 80% of directors thought the impact of the millennium bug on business generally was potentially serious or very serious, but almost 70% described the threat to their own companies as not very serious.

More than half of those surveyed said their millennium bug strategy was currently being implemented, and one-quarter said their strategy was complete. Only 3% said the problem had not yet been addressed, a significant decrease from the figure of 18% in 1997.

Of those companies which said an audit of millennium bug risks had been undertaken (78% of the sample), 11% said the extent of the problem was still unknown, down from 19% last year. Just under a third of directors (27%) reported the millennium bug has had some impact on their business (up from 18%), while 68% said the bug had yet to affect current operations.

The government is moving to address the litigation concern. A meeting of state and federal ministers with Y2K responsibilities has led to their agreement on the introduction of national legislation limiting the legal liability of companies which disclose information about their preparedness for the millennium bug. There have been repeated calls for such a law, often referred to as 'Good Samaritan' legislation.

The national legislation, which has been endorsed by ministers from every state and will be introduced to Federal Parlia-



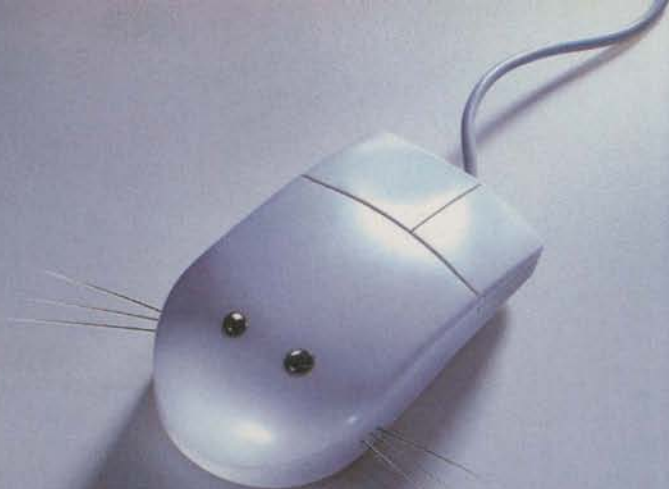
ment early in 1999, will provide limited legal protection for statements about Y2K readiness made "in good faith". Companies can still be sued over defective products resulting from Y2K, but statements admitting the problems will be inadmissible as evidence. The legislation will run until June 30, 2001, giving companies time to fix problems which only become apparent after the Y2K 'deadline' of January 1, 2000.

The meeting also agreed that government departments should provide at least quarterly statements concerning their own Y2K preparations. However, a widely promoted move to provide preparation details for individual departments was rejected in favour of a more general overview. A common format for such statements is due for release in the first quarter of 1999. Another meeting of the ministers has also been set for that time.

Those figures which have been issued for government departments paint a mixed picture. Overview figures for work up to November 1998 indicates that while several government agencies have made all their computer systems Y2K-compliant, the key areas of health and payments are failing to make progress. The figures are an update of similar data released in July 1998, which covered activity through until May.

Major progress has been made in the area of employment, where 92% of systems were compliant, up from 25% in May. No other key government service had above 50% compliance, but many made substantial progress over the six-month period.

Josh Gliddon, Angus Kidman and Roulla Yiaccoumi



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As the DOJ trial continues, the Microsoft CEO's behaviour is under the spotlight.

Is Bill Gates a sociopath?

He's a control freak, a sociopath and a victim of tall-poppy syndrome. That's the conclusion psychologists have drawn after examining some of the infamous videotape footage of Bill Gates' deposition in the Microsoft trial.

A group of three US psychologists were shown two hours of the footage by *US Network Week* magazine, and given biographical information about Gates. The trio told the magazine they were ethically and legally prohibited from drawing absolute conclusions about Gates' psyche without talking extensively with him first, but they were able to point to some patterns of behaviour which lead to this conclusion.

"It's very clear that Bill Gates is a person who needs to remain in complete control of the situation," forensic psychologist Dr Ronald Ebert told the magazine, adding that Gates was masterful in the way he handled DOJ prosecutor David Boies while giving his testimony.

"He just toyed with the prosecutor. Non-verbally he says, 'Just in case you thought you were in charge, I just want you to know that nobody is in charge of Bill Gates'," said Ebert. The doctor said Gates' only odd behaviour was his rocking, which he concluded was how the Microsoft boss remained focused. He did not see Gates as a mad genius: "Rather, I see him as a bright, focused entrepreneur who has been able to use his nonconformance streak to remarkable advantage."

Aggressive and antisocial?

A sociopath is clinically defined as a person with aggressive, antisocial behaviour, and Gates could fall into this category, according to sociologist and university professor Jack Levin. "He's able to manipulate the reins of power without heavy emphasis and ethics. He controls with moral impunity. He shapes the truth to his own liking. Bill Gates isn't afraid to go outside of [society's] established rules and regulations," said Levin, author of 19 books on human behaviour.

Levin described Gates as more crafty than crazy. "He's not the least bit confused, doesn't talk to dogs, hallucinate or hear words spoken in an empty room.



Some psychotics may be as smart as Gates, but they are generally much more confused," said Levin.

Harvard Medical School clinical professor Harold Bursztajn took the view that we should look at Gates through the eyes of the general public. He said the public's view of Gates is going through a typical cycle in which society first glorifies people of particular interest and then figuratively crucifies them once they step out of their defining role. "So when Bill Gates was fighting against IBM and he was the little guy, that was OK. But now that he is the big guy, then he must be part of the evil empire," Bursztajn told *Network Week*.

The footage of Gates hasn't played a significant part in the overall DOJ antitrust trial, but it has inevitably been the focus of much public interest. Gates' recalcitrance and apparent forgetfulness have made him the target of much derision in the press.

In one exchange that is likely to become legendary, Gates argued with DOJ prosecutor David Boies over an email sent to him by a Microsoft staffer. "'JDK 1.2 has JFC [Java Foundation Class], which we're going to be pissing on at every opportunity,'" the email read. Gates denied that the memo implied an intent to attack Sun's Java implementation: "I don't know if he is referring to pissing on JFC, or pissing on JDK 1.2, nor do I know what he specifically means by 'pissing on'," Gates said. Boies eventually

asked if 'pissing on' was Microsoft code for planning to say something nice about someone, which drew laughter from the courtroom. Other footage replayed has even caused Judge Thomas Jackson to laugh.

Microsoft has fought against the release of the footage, at one point asking that no more of it be played in the courtroom. It has also released a series of increasingly aggressive statements decrying the use of the footage.

"Rather than call Mr Gates as one of its witnesses, the government apparently would prefer to use his deposition out of context to further its PR campaign to besmirch the reputation of Microsoft and Mr Gates, and to distract the public's attention from the lack of credible evidence supporting the government's claims," one such statement read. "Rather than the entrepreneur who has played such a pivotal role in the creation and development of the Information Age, Mr Gates is portrayed as forgetful or non-responsive when the government is left to do the editing."

Gates' team will, of course, get their chance to fight back. As APC went to press, Microsoft's defence case was expected to begin in early January. Nine of its 12 witnesses will be Microsoft staff; while Gates isn't on that list, he could be called as one of the two rebuttal witnesses allowed to each side in the trial.

Angus Kidman and John Sterlicchi

WordPerfect Office 2000

The WordPerfect suite has always been a fine office suite, no matter what its name. Its products, centred around the former word-processing market leader WordPerfect, are of good quality, but the suite has suffered because of the dominance of Microsoft's excellent Office suite. There was also something haphazard about Corel's previous versions of the office suite, as Corel apparently wanted to bundle every product it possibly could, resulting in somewhat messy releases.

If Beta 2 of WordPerfect Office 2000 is any indication, then Corel has done a great job of rationalising the profusion of applications in the suite, and moving towards a more consistent interface across the applications. (As an aside, it's probably important to clear up the lineage of WordPerfect Office 2000, as it means yet another name change for the product; the currently available release is called WordPerfect Suite 8, and WordPerfect Office 2000 represents the next incarnation.)

The install procedure now approaches the elegance of the Microsoft install, and features a new 'install as you go' capability, which prompts users when an uninstalled feature is called upon, allowing instant installation of the required program files. We had the product installed in a matter of minutes. No rebooting was required, although we were required to locate a specific DLL on our hard drive — presumably this will be fixed in the release version.

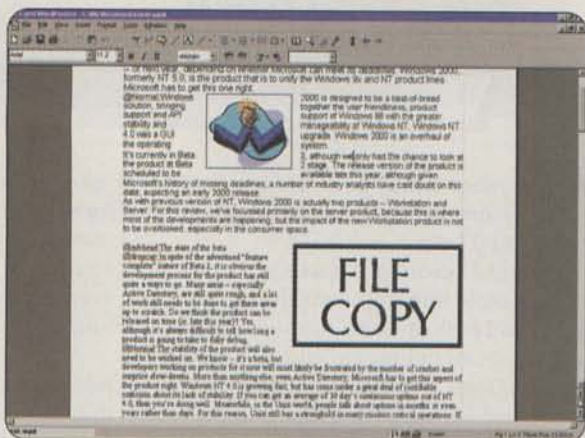
WordPerfect Office 2000 doesn't represent as much of a shift from WordPerfect Suite 8 as Microsoft Office 2000 does from Office 97, but it does have a number of nice tweaks, and it matches, and in many cases exceeds, the feature set of Microsoft Office 97. That aside, WordPerfect Office 2000 is not going to be a compelling upgrade for existing users of WordPerfect Suite 8 or Microsoft Office 97 — some of the new features are nice, but few are really significant enough to justify the purchase of this product purely as an upgrade.

Perhaps the most significant changes are the integration of Trellix, a "Word Processor for the Web era", and the support for Visual Basic for Applications (VBA). Through support for VBA in particular, Corel hopes to tap into the vast number of VBA developers currently working on integration with Microsoft Office features. Getting them to actually develop for WordPerfect Office may prove to be a challenge, however. WordPerfect

ing tips in the range of applications.

Printing features have also been improved in all applications, with better print-preview capabilities and a Perfect-Print system. This system is designed to make it easier to format documents for different paper sizes and deliver better dual-sided printing.

So what are the applications? Beta 2 was delivered with WordPerfect 9, Quattro Pro 9, Presentations 9, CorelCentral 9 and Paradox 9 — a suite of core applications which puts it on a par with Microsoft Office (word processor, spreadsheet, presentation package, PIM and database development). WordPerfect Office 2000 will also include Trellix 2.0, Bitstream Font Navigator 3.0, Acrobat Reader, several other relatively minor utilities, along with the usual spate of clip art, photos, fonts and sounds we've come to expect from Corel. Dragon NaturallySpeaking will be integrated into some versions of the product when it is released, although it was not functional in the beta we looked at.



Office 2000 remains fully backward compatible with PerfectScript as well, so organisations which have invested heavily in production of macros and scripts for previous versions of the suite will not be left cold. Corel also claims to have vastly improved its file exchange capabilities in this version, although in Beta 2 many of these were not functional.

Corel has also cleaned up the application interfaces, making them sharper and more visually appealing. They are also now more in line with Microsoft Office, which enables a smooth transition between the two products. The influence of CorelDRAW and Ventura can be seen in a number of the products, with a nod towards design as well as content creation.

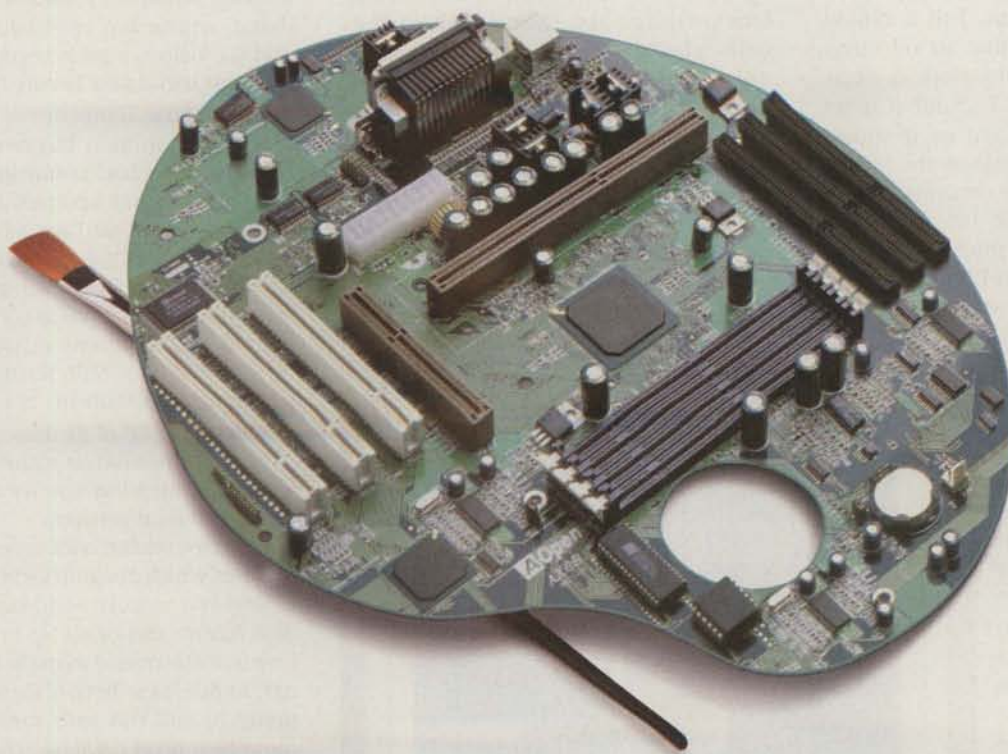
The PerfectExpert, a system of wizards and help tools, assists tremendously in the latter. It aids with more than just the 'how do I do this?' questions, providing valuable design tips and walkthroughs for the creation of many different documents. It works in more than just WordPerfect too, provid-

A look at the applications

WordPerfect is a fine word processor, but Corel has addressed some of the complaints made by users of previous versions. It has replicated the few features of Word 97 that WordPerfect 8 lacked. It now offers better multi-language support, improved text art and very good hyperlink support (a feature that existed in WordPerfect Suite 8, but was not as well implemented).

Navigation has been 'improved' with an autoscroll tool and the unnecessary and somewhat token addition of 'browser-like' features (back/forward buttons and bookmarking). The Autoscroll tool is useful — you click on an icon at the top of the screen, your mouse pointer changes and you can navigate the document simply by moving the mouse around the screen. The utility of the browser buttons is questionable, however, especially when such features already existed in the product.

Another notable extra is a real-time preview, which works somewhat like the preview features in Adobe Photoshop and other graphics packages — you can check



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Serv/5947

out design changes before actually applying them to a document. This is handy, but not earth-shattering. In addition, fonts can now be embedded in documents, allowing users without a given font to view a document as it should appear. Of course, this bloats the file but could be useful in many circumstances.

The Scrapbook, that handy feature that enables users to manage massive clip-art, image and multimedia collections, has been improved in this version of WordPerfect Office, with better organisational features and a very cool drag-and-drop capability. Just grab some clip art from the Scrapbook pane, drag it onto the document and there it is. The Scrapbook actually works for the other applications in the suite as well, but is most useful in WordPerfect.

Still, apart from these few new features, there are not a lot of changes to the word processor that shipped with WordPerfect Suite 8. It remains probably the closest thing to a DTP package in a word processor that you can get, and is quite possibly the best product of its type available. Not a lot has been done to WordPerfect 9, but not much needed doing.

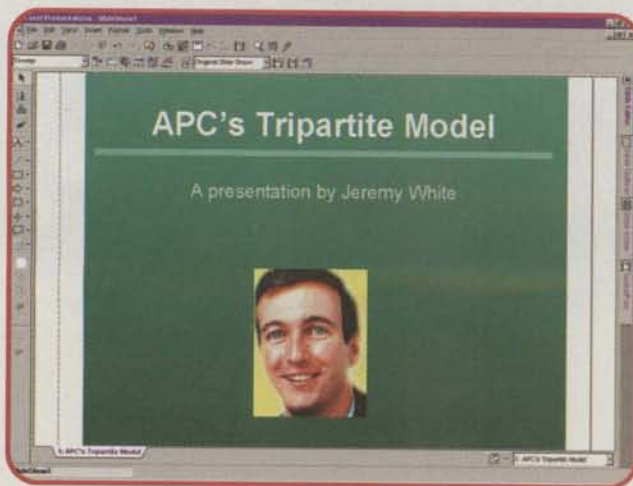
Although the new XML feature is not properly implemented in Beta 2, it already appears to be tacked on, rather than integrated with the suite. WordPerfect takes care of inserting and maintaining XML tag pairs to create XML documents. This does not mean it uses XML in its file format *à la* Microsoft Office 2000 (WordPerfect 9 continues to use the same file format it has used since Version 6.1), but it does help experienced users create XML documents.

The big news in the spreadsheet application, Quattro Pro 9, is the vastly increased sheet size. Previous versions supported only 8,192 rows and 256 columns; it can now support a million rows and 18,278 columns, which puts it more on a par with Excel. This is great news for people planning to do massive spreadsheets, but it should have been implemented quite a few versions ago.

A lot of other features have been introduced, most of which are of the catch-up variety. Some of the more innovative features include the menu customisation man-

ager, which enables you to set up the buttons just as you like. The new group collaboration features are also first class, and are not found in the leading spreadsheet (Excel). Multiple users can open a workbook at the same time, while changes can be reviewed, accepted or rejected. Nice, but not as manageable as we would like.

Another strong new feature is merge/compare sheets. Multiple copies of a document can be merged into one, with



all changes stored and the originals hidden. We found it easy to use, and it should prove to be quite useful, particularly for mobile users. All up, Quattro is improving nicely, and with the latest release it is getting closer to feature parity with Excel — but it's not quite there yet.

Presentations is a fine effort at copying the features of PowerPoint. It's easy to use and covers almost all the important features of the latter, with the added advantages of the Scrapbook and PerfectExpert. When it is fully integrated with Trellix, it could also make Web site development easier.

It hasn't received much of an update in this latest version, but has benefited from the global changes to the suite mentioned above. Some mildly useful image features are supplied, although they are not really things that your typical corporate executive is going to find much use for.

Paradox, the database application, has always been a good tool for the creation of simple databases, but has always run second behind the elegance of Microsoft's Access. Not much has changed in this latest version, with the exception of some improved ODBC, SQL and JDBC (ODBC for Java) connection agents. The JDBC driver is completely new, and provides connectivity with Paradox's database engine (which is

actually Borland's Database Engine). The design engine has received some tweaks, and the help system is improved. Perhaps the most useful new feature lies in the Vertical Database Templates — a set of templates for common business databases. Using these, we had a small inventory management database up in less than an hour.

Last but not least, there's CorelCentral 9. This is a great little PIM which is quite able to match Lotus Organizer on a personal level, although for group collaboration, it cannot match recent versions of Organizer or Outlook. Still, for the tracking of personal information, it's a very able product, in spite of its annoying habit of sitting on the taskbar rather than in the Systray (something else we hope is fixed before the final version).

The new version adds support for a 'Day Planner' which integrates with the calendar to keep you in touch with your tasks for the day. Alarms can be set up to notify you of events on the calendar and in the Day Planner. At this stage, both of these features are pretty rough, but with some smoothing could be a good addition. The other main feature of the latest release is support for PalmPilot synchronisation.

Trellix, which we looked at last year (see APC April, page 36), hasn't changed and we won't repeat that review here. As of Beta 2, its integration with the rest of the suite is limited to an 'export to Trellix' option in the 'File' menus of the applications. Doing so is a simple task, and it opens the document, almost as is in Trellix, an ideal environment for quickly formatting the information for export to a Web site. It would have been far more useful to actually have the features of Trellix integrated into WordPerfect, but it is a good start. According to Corel, much more work is being done on Trellix integration before the final release.

Basically, WordPerfect Office 2000 is a good package, and new users will be more than pleased with the applications, but existing users probably won't be tempted to fork out for an upgrade.

Nathan Taylor

Corel WordPerfect Office 2000

■ Distributor	Corel
■ Phone	1800 658 850
■ Online	http://www.corel.com/
■ Price	TBA
■ In short	A good suite, but probably not worth the effort as an upgrade.



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Olympus C-900 Zoom

lympus has always been one step ahead on the camera front, and its latest compact digital model, the C-900 Zoom, notches up a few more pioneer points.

The shape and size are nothing new — the camera is based on the company's existing C-800/840 compact digital range. It features a slide-back front cover power switch, back-mounted LCD image screen, top-mounted status LCD, megapixel capability and a slot-in 4M SSFDC SmartMedia wafer RAM card.

The new feature on the C-900 is the 3x optical zoom, offering the equivalent of 35mm to 105mm in film camera terms. An extra 2x digital zoom is also available in SQ mode — one of four quality settings offering up to a maximum of 60 shots as standard. The lens uses an eight-element, f:2.8 glass lens which motors out from under the cover when the camera is powered up. All this electromechanical action obviously chews up the juice, so Olympus bundles a set of four NiMH AA batteries and a charger into the pack as well as the usual connector cable and software CDs.

Basic operation is very simple, even to the inexperienced user. Slide back the cover, point and click. The zoom control is next to the shutter button, and pushes forward for wide and back for tele. This control is linked to the dioptre-adjustable viewfinder, but the LCD image panel can also be powered up to frame shots exactly. The back panel sports a range of some nine press-button controls that operate menu setup, image quality, timer, flash, step-focus and more. These are much more like Olympus' SLR-style 1400 series controls than previous compact versions, and in some ways are less user friendly.

Supplied software includes the Came-dia transfer and PhotoAlbum user programs. The former allows the camera to be seen by a PC as a drive as soon as the connection is verified. It also allows images to be dragged straight into the host PC. Photo-Album is a much simpler utility, and allows one-touch import into the basic viewing/printing program.

In many ways, the camera offers more comprehensive controls — such as


optional fast-focus setting, white balance and exposure metering choices — than Olympus' previous compacts, but is definitely more demanding to use due to the proliferation of buttons. However, the image quality is excellent at both extremes of zoom, with very smooth tones and top resolution all round. Overall, this is a very capable pocket-sized performer which matches many of the semi-professional digital cameras now on the market.

Jeremy Torr

Olympus C-900 Zoom

■ Distributor	R Gunz
■ Phone	(02) 9935 6600
■ Online	http://www.olympus.com/
■ Price	\$1,699
■ In short	Equal to a semi-professional digital camera, at a pocketable, bargain price — but more complex than previous Olympus compacts.

Hewlett-Packard Jornada 820

he latest incarnation of CE, Windows CE 2.11 or Pro, is aimed at the in-flight tray device, not the pocket device.

One of the first tray-tops off the blocks to use the new version is Hewlett-Packard's Jornada. It is an A4 clamshell with a usable keyboard and an impressive screen. The key spacing is right on the money for touch-typing. Some keys such as Home and Caps Lock have been sacrificed in the quest for space.

The screen is a bright TFT LCD with normal aspect ratio, and an 8.2in diagonal dimension. No touch-sensitive layer is included, as all mouse commands have to be made via the teeny touchpad, which despite looking far too small, actually works better than many bigger units. In terms of expansion and connection, the Jornada has a PC Card Type II slot, a CompactFlash slot, power-in, an IrDA window, a serial PC connector, XGA video

out, a USB port, and an RJ12 for the built-in V90 modem. A microphone and speaker also hide alongside the touchpad. All this is pretty impressive for a sub-kilo package.

Inside the titanium-grey plastic casing lurks a 190MHz StrongARM CPU, backed up by 16M of ROM and 16M of RAM, expandable to 32M. It also features instant-on, powering up at wherever you left off last time, and single-key access to all the major applications such as Pocket Word, Access, PowerPoint, Voice Recorder, Contacts, bFAX, Calendar, Explorer and more. It also comes with realistic battery life. The 7.2V lithium-ion slab fits under the front of the keyboard and powers the engine for a welcome 10 hours of real-life work time.

The bundled software CD includes preview software for image management, PDA synchronisation, Java applets and file viewing. The CE desktop also includes Hewlett-Packard's own elegantly simple

and fast dial-up connection wizard, plus the ubiquitous Hewlett-Packard calculator, dubbed OmniSolve here.

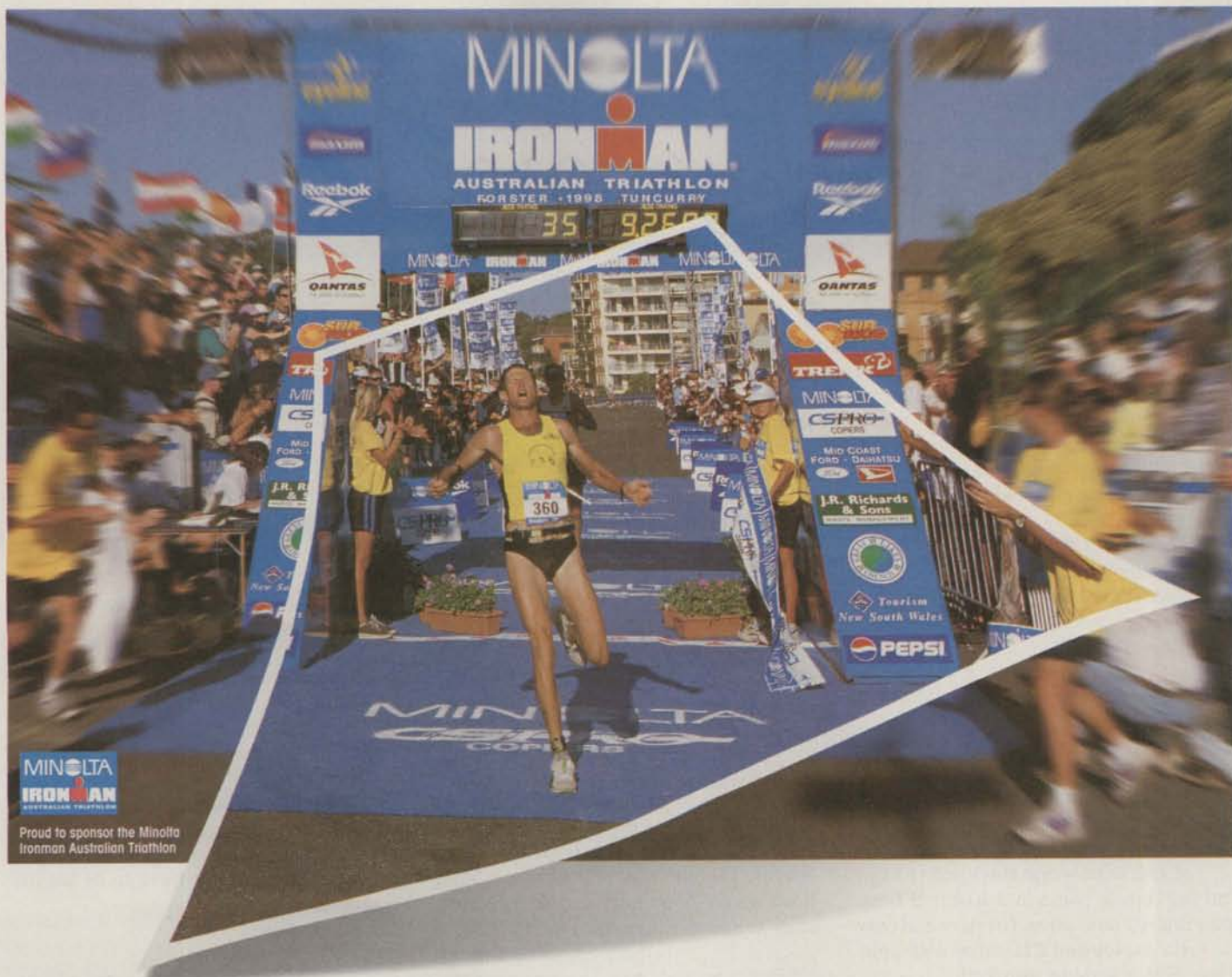
If you remember the Apple eMate and mourn its loss, Hewlett-Packard has come up with an attractive (although PC-based) alternative which has all the good points, plus improved connectivity and better file compatibility. If you are in the market for a lightweight device that can handle mainstream applications, the Jornada is a much better bet than any power-hungry notebook or restrictive palm alternative.

Jeremy Torr

Hewlett-Packard Jornada 820

■ Distributor	Hewlett-Packard
■ Phone	131 347
■ Online	http://www.hp.com/
■ Price	\$1,999
■ In short	A very attractive and well-designed Windows CE device.





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MINOLTA

Toshiba Portégé 3010CT

Most of the big notebook companies save their extremely thin and light notebooks for the Japanese market, but Toshiba has taken the unusual step of releasing one such model in Australia.

The Portégé 3010CT made its debut in the land of small wizardry gadgets in mid-1998, pitched directly against the similarly slim Sony Vaio (which has never been released locally). We reviewed Acer's contribution to the compact notebook market, the TravelMate 310 series, a few months ago (see APC December, page 46).

The Toshiba offering is more powerful, has a faster processor (Intel Pentium 266MHz MMX, versus Acer's 200MHz MMX) and double the amount of video RAM packed within its 1mm thick brushed magnesium alloy case.

The two units weigh the same (1.3kg), but the Portégé packs in a 10.4in TFT display and 4G hard drive. The Acer had only an 8.4in display and 2.1G drive. Both units have 32M of RAM as standard.

An easy notebook to travel with, the Portégé 3010 is less than 2cm thick, and the hard drive is just 8.4mm thick. Both the floppy and CD-ROM drives are external, and the small port replicator must be attached in order to connect any peripherals. There are two Type II PC Card slots, infra-red and USB ports, and external volume control.

The notebook may boast a 'full keyboard', but we had difficulty typing on it, as there isn't much room for error on the tightly packed keys. The screen, however, is very good: crisp and capable of 800 by 600dpi internal resolution and 1,024 by 768dpi with an external display. Navigation is via Toshiba's standard small green pointer sitting between the G, H and B keys.

We tested the Portégé with the new WinBench 99 and Winstone 99 benchmarks, where it returned positive results (see table). It scored 1,246.7 in the Business Disk WinMark, and a much higher 4,610 in the High-End test.

A NeoMagic 128-bit controller with 2M of integrated EDO RAM provides video support, and a standard Sound Blaster Pro-compatible card is responsible

for the audio. The video controller scored 33.4 in the Business Graphics WinMark 99 test, and 132.3 in the High-End Graphics test.

The lithium ion battery, which returned a good two hours and 41 minute BatteryMark result, resides in the hinge region of the notebook and can be removed very easily. In Japan, a one-and-a-half-hour battery is acceptable, as most people would travel with their notebooks and plug in the mains power at the other end. But before Toshiba could release this notebook in Australia, the battery needed to be capable of at least a two-hour life, which it easily achieved in our tests.

A confident three-year warranty by Toshiba should allay any fears you may have about how much rough handling such a small notebook can take. The

Portégé has internal structural bracing and shockproof mounting for the hard drive and display.

Toshiba says you can place up to 15kg on any spot on the closed cover of the notebook without breaking the display. And in case you destroy your system completely, Toshiba now ships recovery disks as standard with its machines.

Pricing for the Portégé 3101's standard configuration starts from \$4,395 — not bad at all considering the quality, performance and sheer style Toshiba has brought together.

This fantastically sleek and light notebook will appeal to travellers who are tired of hauling around standard 4kg notebooks. It's not a super-duper performer, but it doesn't have to be for its target market.

Roulla Yiacoumi



Benchmark results and details for Toshiba Portégé 3010CT

Product	Toshiba Portégé 3010CT
Distributor	Toshiba
Phone	1800 021 100
Online	http://www.toshiba.com.au/
Price	\$4,395

SYSTEMS SPECIFICATIONS

Hard disk controller	Toshiba Extended IDE Controller
Hard disk file system	FAT32
Video bus type	PCI
Video RAM	2MB EDO DRAM
Video Controller chip	NeoMagic NM2160
Tested resolution/colour depth/refresh rate	1,024 by 768/256/60Hz
Pointer device	AccuPoint control stick
Dimensions (cm) (H by W by D)	2 by 25.7 by 21.6
Bare minimum weight (kg)	1.19
Travel weight (kg)	1.3
PC Card slot type	2 Type II
Port replicator	Yes
Docking station	None

CD-ROM drive	10x TEAC CD-211E (supplied separately)
Tested CD-ROM controller/cache settings	ATAPI/Windows
Soundcard	Yamaha OPL3-SAX
Modem	None
Display	10.4in TFT colour LCD
Maximum internal resolution by no. of colours	800 by 600
Maximum external resolution by no. of colours	1,024 by 768
Battery type	Lithium ion
Operating system	Windows 98
Warranty terms	Three years

BENCHMARK RESULTS

Business Winstone 99	8.02
CPUmark32	456.33
FPU WinMark	1,016.67
Business Disk WinMark 99(K/sec)	1,246.67
High-End Disk WinMark 99 (K/sec)	4,610
Business Graphics WinMark 99	33.43
High-End WinMark 99	132.33
CD-ROM WinMark 99 (K/sec)	628
BatteryMark 2.0 (hours:minutes)	2:41

The product used in these tests is the shipping version available to the public at the time of publication unless otherwise stated. Winstone, WinBench and associated products are registered trademarks of the Ziff-Davis Publishing Company. These tests were performed without independent verification by Ziff-Davis Publishing Company.

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Gateway GX-450

Gateway's latest top-of-the-line consumer PC is the GX-450, which houses a 450MHz Intel Xeon processor and a 512K level 2 cache. We reviewed a GX-450 that was configured, according to Gateway, to be the ultimate games machine. However, we had to wonder why Gateway chose some of the components.

Unlike the plain old Pentium II, the Xeon's level 2 cache operates at the same clock speed as the processor (450MHz in this case). This makes the Xeon perfect for a server system, because it can handle a high volume of transactions, such as the disk read and write operations, servers perform. So what's a Xeon processor doing in a consumer system?

As a base model, the GX-450 comes with a 16M STB nVidia TNT display card based on the impressive nVidia Riva TNT chip. Gateway gives you the option of adding either one or two 12M 3Dfx Voodoo2 cards (the system we reviewed came with one). Given the impressive 3D performance of the Riva TNT, the addition of a Voodoo2 card would only be useful for games designed specifically for 3Dfx's Glide API.

The GX-450's Boston Acoustic Digital Media Theatre speaker and subwoofer set is matched with a Creative Labs Sound Blaster PCI 64D soundcard. This is not a particularly bad soundcard, but it is Creative Labs' third in line, after the Sound Blaster Live and Sound Blaster PCI128. The sound was not unimpressive, but audio purists might be a little put off, particularly since the soundcard is about the only component of the system Gateway doesn't let you upgrade.

We tested the GX-450 alongside a Pentium II-based Gateway G6-450 using the Ziff-Davis WinBench 99 and Winstone 99 suites of tests to see if the addition of a Xeon processor gave any significant advantages to justify the extra cost. The Xeon-based machine beat its Pentium II-based equivalent in every test, but it was interesting to see which tests showed the most significant differences. The CPUmark32 and FPU WinMark tests revealed the Xeon-based machine had a marginal advantage in processing grunt, but nothing spectacular. The Xeon machine's 2D graphics scores were much higher than those of the Pentium II machine, but this could also be due to the difference in graphics cards (the G6-450 we tested was an older model with an ATI Rage 3D card). On the other hand, 3D



graphics were only marginally better when we compared the performance of the Voodoo2 cards in both machines. As expected, the Xeon-based machine totally blew away the competition in disk access.

Although the Xeon system has distinct advantages, we wonder if these improve-

ments really justify the price, given the strong consumer and games focus of this system. The area where the Xeon system clearly outshone the Pentium II system was disk access, an area that has little impact on games performance. And while the GX-450 managed smooth 3D gameplay even at 800 by 600 resolution, we found the visible improvements over the G6-450 were marginal, if at all noticeable.

You could quite easily put together a G6-450 with all the same components as the GX-450 we tested, except for the Xeon processor, and come out with about \$1,000 spare change. It's a terrific machine, but unless you're planning to use your PC for disk-intensive applications the extra cost of a Xeon may not be justified.

Josh Mehlman

Benchmark results and details for Gateway GX-450

Product	Gateway GX-450
Distributor	Gateway
Phone	1800 500 734
Online	http://www.gw2k.com.au
Price	\$7,497

SYSTEM SPECIFICATIONS

Processor	Intel Xeon 450MHz
RAM (M) and type	128M SDRAM
L2 cache (K)	512
Hard disk drive	14.4G IBM Ultra ATA
Hard disk controller	Intel 82371 AB/EB PCI Bus Master IDE Controller
Hard disk file system	FAT32
Video bus type	AGP/PCI
Video adapter	STB Velocity 4400; STB Blackmagic
Video RAM size	16M/8M
Video RAM type	SDRAM/EDO
Video controller chip	nVidia; 3Dfx Voodoo2
Monitor	21in
CD-ROM drive speed	24x
CD-ROM drive model	Toshiba DVD-ROM SD-M1202 plus 2x Write CD-R
Operating system (bundled)	Windows 98

BENCHMARK RESULTS

CPUmark32	1,236.70
FPU WinMark	2,330
Business Graphics WinMark 99	181
High-End Graphics WinMark 99	521.3
3D WinMark	448

BENCHMARK DISCLOSURE INFORMATION

Flat shading/ Gouraud shading	Capable/Capable
Dithering/Z-Buffer	Capable/Capable
Perspective correct textures	Capable
Nearest/Linear	Capable/Capable
Nearest mipmap nearest/Linear	Capable/Capable

BENCHMARK DISCLOSURE INFORMATION

Mipmap LOD Bias	Not capable
Modulate/Decal Texture Blending	Capable/Capable
DecalAlpha/Modulate	
Alpha texture blending	Capable/Capable
Flat Wrap texture addressing	Capable
Cylindrical Wrap u/Wrap v	Capable/Capable
Clamp/Mirror texture addressing	Capable/Not capable
Cull counterclockwise/Cull clockwise	Capable/Capable
Cull none	Capable
Fog vertex linear/Fog table linear	Capable/Capable
Fog table exponential/ Specular highlights	Incorrect/Capable
Colour key/Alpha transparency	Capable/Capable
Source alpha/Add pixel blending	Capable/Capable
Modulate Pixel/2X Pixel blending	Capable/Capable
Alpha Vertices/Perspective	
Correct Alpha	Capable/incorrect
Alpha Comparison Greater Than/ or Equal	Capable/Capable
Alpha Comparison Less Than/ Less Than or Equal	Capable/Capable
Z Comparison Greater Than/ Greater or Equal	Capable/Capable
Z Comparison Less Than/ Less Than or Equal	Capable/Capable
Z Accuracy/Bias	Capable/Incorrect
Anti-aliasing 640x480/ Triangle Rasterization	Incorrect/Capable
Texture Fidelity/Swapping	Capable/Capable
High Triangle Count	Capable
Fog Vertex and Colour Key	Capable
Fog Vertex and Alpha	Capable
Alpha and Linear	Capable
Alpha and Linear Mipmap Linear	Capable
Small Triangles	Capable
Perspective Correct Color/Specular	Incorrect/Incorrect
Anti-aliasing 1024x768	Incorrect

Note: All systems are tested under a screen resolution of 1,024 x 768 pixels with 16-bit colours, and refresh rate of 60Hz. The product used in these tests is the shipping version available to the public at the time of publication unless otherwise stated. Winstone, WinBench and associated products are registered trademarks of the Ziff-Davis Publishing Company. These tests were performed without independent verification by Ziff-Davis Publishing Company.

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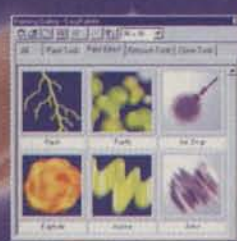
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Seagate Crystal Reports Professional 7

Reports are the bane of many offices — while raw data can be plentiful, its presentation as a final report can leave a lot to be desired. For some time, Crystal Reports has been one of the best report-writing packages for Windows-based machines, and the latest release looks to extend the current feature set and smooth the creation of Web-enabled reports.

The last time APC looked at Crystal Reports was on the release of Version 5, and we noted that its range of reporting tools was finally beginning to extend beyond those found in most inbuilt tools in data storage packages. The range of reports that now ship in Crystal Reports 7 would be more than enough for most offices.

It enables you to access data from a wide range of data files and databases, from an ASCII file through to relational databases like Sybase and Oracle. After an easy software installation, we found connection to data sources very easy to set up, with native drivers in the package to access most of the latest releases of popular Database formats.

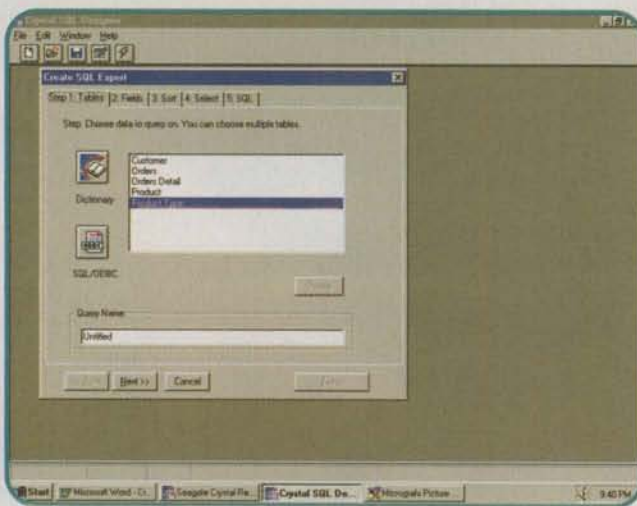
Query creation in Reports 7 is very flexible, using the inbuilt Crystal SQL Designer Module. Users can open existing queries, create new queries with either a query wizard or by writing the SQL directly. Reports 7 supports all standard SQL commands. The inbuilt query help system provides comprehensive tips on writing smoother and faster SQL.

Version 7 provides two means of creating reports. The previously available Report Designer is back, alongside the new Crystal Query Designer. Crystal Query Designer is ideal for quick, ad hoc reports. It implements a Java interface which prompts users for common query styles and output methods, making it ideal for end users. The queries created can be accessed and modified through any JVM-capable browser. A nice addition for organisations running multiple platforms.

If you want something a bit more complex, the more powerful options of the Report Designer are not available through Crystal Query designer. The Report Designer uses a Visual Basic environment to create the layout of the report. The first-

time Crystal Reports user will find the inbuilt help system useful — it's interesting to see a program of this complexity and flexibility given a simple interface. A wizard called the Report Expert enables a new user to create detailed reports, but the more complex style of report (notably the cubes) require more in-depth knowledge of the program.

Crystal Reports 7 offers complete object modelling for designing custom



interfaces for input data. Full control over data types and limitations is available. A new addition to Version 7, the Analyzer Tab, enables the user to select the properties of a chart or an imported map separately from the rest of the report. The maps, which can be placed in all types of summary fields, can be used as part of the 'drill-down' ability to show sub-reports. The Analyzer tab is very easy to access from either the map or the chart.

Charting, which has long been one of Crystal's strongest points, has been made even more flexible. Version 7 includes 11 chart types and 47 chart templates. With everything from standard bar and line charts to doughnut and 3D surface charts, most users will be able to find a chart to suit their needs. If your needs extend beyond this, Crystal Reports 7 also includes a chart editor to create custom charts.

The software is also server-friendly, with the option to place all processing at the originating server, a useful function to speed report generation. Legacy support for older ASCII reports is also provided,

and ASCII reports can be imported as a Crystal report. This is extremely simple. Just open the legacy file through an import option, highlight the relevant section of the old report and compile the file as a fully functional Crystal Report.

All sub-reports can be created on demand, which keeps data hidden until the user accesses it through 'drill down'. This feature is very useful for stopping the user from being overloaded with data. Also, given that Crystal allows multiple sub-reports on a report, the data becomes much easier to cope with.

This latest release offers more options for exporting the final reports: for instance, as a Microsoft Word or HTML file. Multiple releases of the same package are also dealt with intelligently, with the option to save as different release formats — for example, anything from Excel 2 upwards can be saved as distinct data formats.

While Crystal Reports 7 offers a lot to end users, its level of design complexity also makes it a useful tool for developers as well. The design interface is very user-friendly and clearly laid out. The Report Experts lead the user logically through report creation. The preview tab and design tab are very easy to move between.

The design philosophy of using several modules to keep the different parts of the development separate can be frustrating, as a user has to constantly move between different modules while trying to create the one report. However, Crystal Reports 7 offers everything that is needed for a flexible reporting tool, and could be used in almost any office to create almost any report. If your needs go beyond the generally simple report functions of most inbuilt packages, Crystal Reports 7 is a powerful and flexible package.

Di Roberts

Seagate Crystal Reports 7

Distributor	Agate
Phone	(02) 9870 3600
Online	http://www.seagate.com/
Price	\$532
In short	Powerful, flexible and easy to use.

We welcome comments and suggestions. Send correspondence to APC Readers' Say, PO Box 37, Sydney 1028; or by email to: APC@acp.com.au. All correspondence becomes the property of APC and is subject to editing.

(Un)truth in pictures

I agree with Selina Mitchell's concern over the media's manipulation of images and what this implies for the future accuracy of mass communication (APC December, page 68). But I wonder if the new technology will make things much worse than they already are.

Photographs aside, the mass media has been distorting the truth — through inaccurate or incomplete reports, misleading or irrelevant information, bias and outright lies — since the first newspaper was published. Distortion of the truth can be and is effected in both electronic and print media. This problem, I believe, will continue as long as we have a mass communication system that is driven by profit rather than telling the truth. Until this changes, the continued deception of the public is assured. Technology is simply providing newer and better tools, not a new phenomenon.

By the way, can I say how much I enjoy APC. I purchased two copies prior to subscribing and was impressed by the content, layout and especially the columnists, including the editor. Well done.

Geoff McNamara
Riverwood, NSW

Linux Pocketbook support

Judging by the feedback our \$14.95 Linux Pocketbook has generated, we've hit a hot button with the many readers who are looking to tackle the penguin. For those who don't yet have the Linux Pocketbook, you can find it on sale now at major news agencies, or go to <http://apcmag.com/shop/> to order online.

I've been using Linux for about six years, and found your *Linux Pocketbook* superb. It has interesting, practical material, shiny colour pages, and — amazingly — a Red Hat CD. You'll get my \$14.95 any time with a product like that — we bought three! Well done APC.

Scott Field
Internet

Thanks for an excellent *Linux Pocketbook*. I've been using Linux for a couple of years, but still read it from cover to cover and gained some fresh insights. In my

opinion, it provides a better and more accessible introduction to Linux for a novice user than most books costing around \$100. I hope you will consider publishing an updated version of the pocketbook on an annual basis.

Chris Blake
Internet

Thanks for the pocketbook. This thing is great — as proved by the fact that Alice Springs has sold out, and it's on back order. Well done from all the Linux lovers in the Alice.

Andrew Stephens
Internet

I think you've done a really great job on the *Linux Pocketbook*. The pocketbook is everything I expected it to be, and quite a bit more as well. As an experienced Linux user, I found the material well structured and accurate, and it lives up to your claim as "the ultimate toolkit for rookies and experts alike".

Bradley Broom
Internet

Just a quick note to let you and your team know how much I enjoyed the *Linux Pocketbook*. I was looking forward to it coming out since it was announced, and it was definitely worth the wait. I've installed Linux already (see you later Windows!) and can't wait to do more with it.

Rob Walters
Internet

I managed to track down a copy of the *Linux Pocketbook* this morning. All I can say is "Wow!" I am looking forward to learning a new operating system and hope that it will provide greater experiences than Windows does. I know the *Linux Pocketbook* is as informative as the Windows 98 one was, if not more so.

Corey Wallis
Internet

In defence of Quicken 7

I read the review of Quicken 7 with interest (see APC December, page 40). The reviewer suggested that this version offered 'No startling new facilities'. On the surface this would appear to be the case. However, there is a new facility which is significant

for anyone who uses Quicken to manage their share investments. For the very first time, Australian users of Quicken now have a free share-price update facility.

This is a big step forward for Quicken and a big time saver. Instead of having to spend 40 minutes each month manually entering share prices from a magazine, I can now achieve the same result in a few seconds by simply pressing a button on the Quicken screen. Instead of getting monthly updates, I can now get daily updates. In my view, this is well worth the upgrade price, even if there were no other new facilities.

After using Version 7 for the last few weeks I have also noticed that it is much more stable than Version 6. I was often seeing GPFs under Version 6 and I learned to shut down Quicken and restart it every few minutes to try to avoid them. I've not had a single failure when running Version 7.

Tom O'Dea
Melbourne, Victoria

Net pornography concern

I was appalled that while looking for something as innocent as information on dogs for my ten-year-old son, I was bombarded with pornographic Web sites and obscene language listed in the Web site addresses. You don't even have to go looking for it. Can't we have a secure site for all that sort of filth, that requires users to subscribe and have a password to access it? Personally, I would like to see it banned from the Net.

J Danvers
Sanderson, NT

Ed note: We appreciate your concerns about the potentially pervasive 'push' nature of Net pornography. Our own efforts to replicate your findings resulted overwhelmingly in information about dogs, rather than the sort of offensive material you mentioned.

Correction

On page 76 of the January 1999 edition of APC, a picture of Rosie Cross was printed beside the name Louis Rossetto. APC apologises for the error.



Information wants to be free

Free? Or easy? Modern commerce at the push of a button.

By Helen Dancer

In the halcyon days of the Net — when having Net access was still a bit cool, not just a routine part of life — the Netizen's catchcry was 'Information wants to be free'.

Cyber enthusiasts went to some length to 'liberate' information, sometimes on this premise, sometimes because it was worth a lot of money to somebody else, and sometimes just to prove they could, however much the owners objected.

Around this mantra developed the notion that if it's on the Web it ought to be free, even if the real world attached a cost to the same information. Early online publishing endeavours ran into perception problems as a result; management could only understand the sell-a-magazine-on-a-newsstand-make-a-buck principle.

Integration of media is still an evolving concept, but early forays, such as the subscription-only model of the *Wall Street Journal* online, which detractors said would never last because it involved paying money, show no signs of packing up its awnings and going home.

The notion that if it's on the Web it should be free also runs head-on into the 'new' Web. It is a place full of things to buy, commodities from purveyors as diverse as Liquorlink and Amazon.com. The book company was a watershed in online buying, because it offered a plethora of choice, a temptation which only a true bookworm can understand, and created a desire strong enough to overcome the lingering reticence about putting credit card numbers out in cyberspace.

The concept has since been copied by traditional booksellers, afraid they will be left behind. In a sense they are right. This is best expressed by Douglas Adams' metaphor: when confronted by the digital ocean, river rules no longer apply. Amazon.com changed the way people think about buying books. It doesn't mean tra-

ditional avenues will disappear, but there's no going back either.

Book buyers are lucky. The idea, which makes so much sense, got further off the ground than the IBM/Virgin idea, floated years ago, of giant music servers, which would allow customers to choose, mix and press their own CDs on the spot. Music stores, like most book stores, suffer from the limitation of the size of the storeroom out the back. But if 'out the back' is a virtual concept, choice becomes limitless.

There's no reason why you shouldn't have Bing Crosby and Smashing Pumpkins on the same CD. The CD is just a distribution medium, a mechanism still confused with the content it holds.

As a side issue, buying music off the Web to bypass price and choice strangleholds has long been regarded as the major impetus for Australians to buy online. Price advantages have disappeared in recent months with the weakness of the Australian dollar, according to *www.consult*, and although online shopping for music is on the increase, it's now in decline compared to the purchase of books. Choice, rather than price, rules.

The trend towards buying products online is growing incrementally. Visa Card and *www.consult* undertook a research project before Christmas which found a record number of people going online to do their Christmas shopping, for all the no-brainer reasons — they could do it after hours (between 5pm and midnight was the most often named timeslot), while they were eating dinner, or even in their pyjamas. While credit card shopping was becoming an increasingly comfortable thing for customers, a surprising 41% of first-time-online buyers said that they would only be shopping on Australian sites.

But just as there's no reason not to put Bing and Smashing Pumpkins on the same CD, there's a quaintness associated with

buying what is essentially one delivery mechanism in another distribution medium, when the medium that delivers the product should be just as capable of delivering it in pure form.

The argument has long been that people will pay for a CD or a print, but if you put your art on the Web, the transition between paying for the product in its entirety and paying a 'royalty' for the pleasure of hearing the song or using an artwork is just too difficult to contemplate.

(Forget the reality that the Internet is still too pitifully slow and congested to make such delivery satisfactory at present anyway; I'm looking through rose-coloured glasses towards Internet2 and beyond).

Author Kevin Kelly maintains that paying for product is not the problem — it's the ease and comfort factor that's the roadblock at present. People actually do want to pay for things, he argues, because it cements the relationship (albeit implicit) between them and the person who created whatever it is they want to purchase. What's necessary to promote such responsible consumption, he says, is essentially a lot more information about the work that goes along with it. When you see a picture, you also need to see who owns it, how much it costs, and how to pay to 'use' it. Micro-transactions and auto-deductions figure integrally in his vision of the future of transacting goods and services on the Web.

Venturing online and buying products, while a culturally significant change in the way we look at commerce, is not just an end in itself; it amounts to cutting our baby teeth on the way to understanding the re-commodification of what we consume, and the real value of the stripped-back product, not the product bundled in its delivery mechanism.

Information doesn't necessarily want to be free, just easier to consume. ■



All slow on the superhighway

I've come up with a new get-rich-quick scheme. I just have to think of a way to use the computer power that people waste while they wait for Web pages to download.

By Jeremy Horey

It's quite ironic. Buyers go out and buy rocket-speed Pentium II computers and then plug them into modems that can at best struggle along at 56K, less than the bus speed of the very first PCs nearly 20 years ago.

I would like to have a millionth of a cent for every CPU cycle wasted while a Pentium II PC is sitting there connected to the Internet. If I could think of something that would do something useful with those cycles, I'd be very rich and could retire to a tropical island and go fishing all day. (Of course, people have thought of this before — push technology was the result.)

So we have these powerful computers sitting on our desks, choked off by slow-speed connections to the Internet. What we need is high bandwidth, or broadband, connections. Once we get megabit plus-type speeds, then we can really make some use of those processing cycles.

You can get high-speed Internet connections if you are willing to pay for them. But it doesn't seem that very many people are in a mad rush to cough up the dollars. The total sales of all the ISDN lines, cable modem connections and DSL-type connections is very small compared to 56K dial-up connections. When organisations pay for high-speed access, they share the bandwidth between many users.

So why isn't high-speed access more attractive to Internet users? Of course, the high cost is a major disincentive, but there's more to it than that. The Internet is not that fast. Even if you have a great big pipe feeding out to the giant pipes that make up the Internet backbone, you're still not going to get instant service. This is because the sites you are accessing are on smaller networks or are a long way away, and the data has to pass through a variety of networks to get to you.

On top of that there's all the other traf-

fic on the network. If you were the only user you would probably get pretty good performance, but you'd have to pay a lot to keep all those other bandwidth hogs off the Internet every time you logged in.

So when is high-speed access really going to come into its own? When will we see high-speed Internet connections as the standard? My guess is that this is still nearly 10 years away. I hope I am wrong, but let me explain my reasons and you can decide for yourself.

First, let's look at the Internet itself. If we're going to improve the average Internet connection speed from 56K to 1M, we are looking at a twentyfold increase in performance. For this to be useful, the rest of the network needs to improve its performance by at least 10 times.

Once we get megabit plus-type speeds, then we can really make some use of these processing cycles.

The end user only has one connection to worry about, but the service provider has many. At the ISP level there are the internal networks, both local and wide area. For backbone providers there are networks and long distance connections, such as those across the oceans.

In many cases tenfold improvements will require adding multiple connections. End users are a very long way from the practical bandwidth limits of their connections, but service providers, particularly backbone providers, are in many cases running their connections at the maximum possible speed. This means that speed improvements are costly, involving the duplication of sections of infrastructure five or 10 times.

Very few businesses are prepared to multiply their costs five or 10 times without seeing clear indications that end users

will pay more for the revamped service.

(The charging model is irrelevant here. If users are paying by the megabyte, will their appetite for those megabytes increase tenfold if the structure is faster? It seems unlikely.)

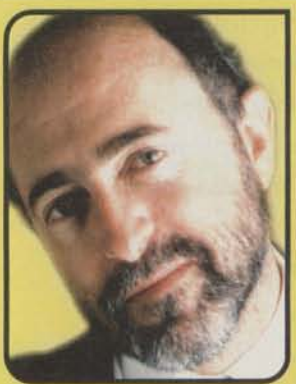
So what about ISPs? Are they going to push high-bandwidth connections? ISPs have a clear and simple motivation to sell high-speed connections at the highest price possible. But do they have any reason to sell high-speed connections at a price which will attract a mass market? Some ISPs may. These will be the ISPs that have plenty of money but not much market share. Selling high-speed connections at just a little more than the current rate of 56K connections will buy plenty of market share in a short time. The trouble

is that today, such a strategy would cost a lot of money and there are not many ISPs out there in this sort of situation.

So it seems there is no powerful push for higher speeds. We'll have to wait while experiments like the Internet2 and the High Speed Internet prove out new very fast backbone systems and start to bring down the costs for high-end bandwidth.

At the user end we will see an increase in the number of users with high-speed access, but until the backbone is fast enough to make it really worthwhile, that growth will be slow. If you think the issues through, you will agree we are looking at about a 10-year wait.

Jeremy Horey is a senior consultant with Tech Talk Australia. You can reach him at jeremyh@techtalk.com.au.



What have you forgotten?

Just as many organisations are smugly declaring themselves Y2K-compliant, dimensions that many haven't even thought about are emerging.

By Philip Argy

By now, many organisations have been following their carefully prepared Y2K-compliance plan for a year or more, and are well on the way to fixing all the hardware and software problems identified as having the potential to operate incorrectly after midnight on December 31, 1999. But there are many dimensions to Y2K that people haven't thought of yet.

I think of the Y2K problem as having multiple layers. At layer one, more than 80% of the population is aware that computer hardware and software, and perhaps even embedded microprocessors, need to be checked and replaced if they can't be fixed. Why? Simply because the consequences of things not working could be sufficient to put an organisation out of business for a while, perhaps even permanently. It is the prospect of disruption to business and the consequences if it is repeated on a medium-to-large scale across the planet that gives rise to many of the dire predictions of a recession and other alarming consequences, some of which are not all that far-fetched when you look closely.

At layer two, about 40% of the population understands there are some less obvious, indirect effects of Y2K. These include the possibility of suppliers of mission-critical goods and services, or key customers, being affected.

If you are a manufacturer of widgets and can't get a critical component, it's no good that 98% of all parts are available. You can't make widgets with parts missing, and the assembly line might have to stop until the missing parts become available. And if the assembly line shuts down, lots of other people will be affected. Similarly, if a major customer's business is disrupted and they can't pay you, then your business can be disrupted. Your business can be at serious risk even if you have fixed 100% of your internal hardware and software problems.

Also at layer two, company directors

realise they have a legal obligation to make sure their companies will not be adversely affected by Y2K. They have to make sure that compliance programs are devised and implemented.

At layer three, less than 5% of the population is aware of the many non-obvious and indirect Y2K issues. For example, many organisations have let their remediation contractors rewrite their historical records to embody four-digit years in every date field. This may sound innocuous enough, but let's assume you were on a jury considering a case where someone is trying to prove that a transaction occurred in May 1995. What if the only record of the transaction was an electronic log file, and its entries were all time stamped 24 August 1998? Wouldn't you at least wonder if the records had been fabricated, or at least tampered with? There are also many laws requiring preservation of historical records. Interfering with their integrity could be an offence.

Another layer-three issue involves insurance. Some kinds of insurance are events-based and some are claims-based. In the first instance, your cover for any event is determined by the policy in force at the time the event occurred. Claims-based policies, on the other hand, determine your cover according to the policy in force at the time a claim is made, regardless of when the event giving rise to the claim occurred.

Insurance that covers the personal liability of company directors and officers is claims-based. So, if directors look at their policy now and don't see a year 2000 exclusion, they shouldn't get too comfortable. You'll find that most insurance companies started adding exclusion clauses last year, as a condition of renewing the policy from 1999 onwards. If the cover is determined according to the policy in force at the time a claim is made, there will most likely be an exclusion of all Year 2000 cover.

Yet another layer-three issue involves people who invest funds, such as superan-

nuation fund managers. Let's assume that you are managing a fund of \$100 million, and that historically you've put 75% of the fund into shares. Your share portfolio has been carefully maintained over many years to reflect a balance between different industry sectors. If you don't understand how industries with a heavy dependence on technology have an above-average Y2K risk, then you may be negligent in investing the funds. Bet you never thought of that!

There are many subtle ramifications of Y2K that people need to start thinking about more conscientiously. We have all heard of class actions in the US where hundreds of people are represented by an entrepreneurial lawyer who sues for millions of dollars, hoping for a settlement in which the lawyer can take up to 30% of the proceeds. (This type of contingency fee is illegal in Australia, although it's now possible in NSW where, for instance, clients agree to pay their lawyer 125% of a previously agreed fee for success, and nothing for a loss.)

The Y2K problem is likely to cause a lot of nuisance events, and when you put them all together, it may progressively lead to serious community, city, state and national disruption. What if it continues for a long time? (Who would have thought that Auckland could be without power for up to five weeks, Sydney without potable water for months, Melbourne without gas for a few weeks?) We might find that the economy slows down quite dramatically, and below the critical levels needed to stave off a recession. The Boy Scouts' motto is the best to follow: Be prepared!

Philip Argy is head of the Intellectual Property, Trade Practices and Technology Group at law firm Mallesons Stephen Jaques. He is also national vice-president of the Australian Computer Society, and chairperson of the Society's Economic, Legal & Social Implications Committee.



Rotting rules of crypto

The global battle for encryption freedom continues, but Australia's government remains blissfully unaware.

By Dan Tebbutt

A genuine legend of the Internet epoch arrives on our shores this month. Phil Zimmermann, inventor of the world's most popular personal encryption software and a courageous campaigner for freedom in cyberspace, will visit Australia to meet with customers and partners of his company, Network Associates. Hopefully he'll find time to impress some common sense on the Federal Government, which remains hostage to the Department of Defence (DoD) agenda on encryption.

Zimmerman is best known for Pretty Good Privacy (PGP), the program that brought strong cryptography to everyday Net users. PGP was written in 1991 when the US Congress threatened to force security software developers to provide backdoor access for government wire-taps. The program was published as freeware on the research-dominated Internet and popular bulletin board systems. This open distribution was intended, Zimmerman said, "to pre-empt the possibility that the Government could suppress this technology later".

Ultimately the threatened legislation never came to pass, but Zimmerman believes PGP's contraband appeal encouraged its adoption. It quickly became a worldwide standard for encrypted email, and it is estimated to have 6 million users today.

Secure communications were a blessing for Internet users, but PGP's international diffusion brought Zimmerman into direct conflict with US security authorities. That's because under the Cold War regulations that govern cryptography, exporting unbreakable products without a permit is illegal under US law — as it is in Australia.

A criminal prosecution was launched against Zimmerman, but his steady resolve attracted support from privacy advocates, civil liberties groups and the wider Internet community. Pitted against them were some of the world's most powerful sectional inter-

ests, including the CIA, the FBI, the National Security Agency and the State Department. Press attention increased the pressure in the first showdown over freedom in cyberspace.

Then came another defiant move from the gutsy Zimmerman. In early 1995, he published the complete source code to PGP in a book, knowing this could not be prohibited because the US Constitution protects free speech. The book ended up in Europe, where the source code was scanned using optical character recognition. As a result, the PGP binaries could be quite legally compiled offshore. In January 1996, the Government faced the inevitable and dropped the criminal case. This allowed Zimmerman to commercialise PGP through a company that later joined the Network Associates utility juggernaut.

Last year, the Clinton Administration made some significant concessions on the encryption export embargo. First, banks and financial institutions were allowed to export encryption to major international destinations without specific permits. This exemption was soon extended to insurance and health-care industries, the offshore subsidiaries of US companies and even some ecommerce merchants.

Speaking to APC before his jaunt down under, Zimmerman likened the process to the fall of the Berlin Wall. "When they let people come across for visitation into West Berlin, it turned into a flood," he said. "Once you start giving people a little bit of freedom, they want more."

Ever more industries will demand removal of restrictions in order to protect business transactions, Zimmerman predicted. "Commercial interests are creating enormous pressure to allow the export of strong cryptography. We need it for international business. If you want to protect your intellectual property assets in a global market, you need to have strong cryptography."

Products like PGP have already made a mockery of export restrictions. Zimmerman

said government policies tended to hurt software developers without stopping the spread of cryptography. "It's just a rotting door that has to be kicked in," he said. "There is so much market pressure building up that the governments who are trying to restrict it are on the wrong side of the power curve."

Sadly, our Federal leaders don't seem to understand this dynamic yet. Australia's cryptography export policies remain under the control of DoD, which is strongly committed to its Cold War stance. Oblivious to the fact that terrorists can type <http://www.pgpi.com/>, <http://www.replay.com/> or even <http://www.cryptozilla.org.au/> just as well as legitimate users, Defence bureaucrats continue as active participants in an international farce known as the Wassenaar Arrangement. This secretive protocol is the basis for local cryptography export regulations that make life hard for Australian developers who want to turn our world-class security expertise into export dollars. Under DoD's rules, it remains difficult or impossible to export general-purpose products containing strong cryptography from Australia. It's a shackle our struggling IT developers can do without.

The supreme irony, however, is that Australia's cryptography controls do not cover the Internet. So DoD's carefully sculpted labyrinth can be essentially ignored by software developers such as the Brisbane-based Mozilla Crypto Group, which hacked its own strong cryptography onto the open source code for Netscape Navigator to create an impenetrable browser. But most commercial buyers still demand the surety of physical product — especially when it comes to hardware!

Unfortunately, Senator Alston has not grasped these issues. While he professes a commitment to encouraging security-related exports, his government says nothing to the naked emperors of DoD. Let's hope Phil Zimmerman raps on the Senator's rotting door. ■

Laying down tracks

The option of being able to create your own data and music CDs is appealing to many people — indeed, it's arguably the non-recordable nature of CDs that has kept conventional audio tape alive for as long as it has. Until fairly recently, CD-recordable (CD-R) drives were quite expensive, as were the blank CDs that go with them.

That has now changed, with even mass-market record stores such as HMV and Sanity stocking CD-R media, and CD-R drives becoming much more common, and much cheaper. This makes CDs an appealing backup medium as well, especially since CD drives are now a standard inclusion in PCs, a major shift from just three years ago when they were an expensive multimedia option.

Price Watch contacted vendors with the view to purchasing an internal CD-R drive. With most of the drives produced using SCSI as a transport mechanism, it's important to note whether or not a package includes a SCSI card, as this can raise the price of installation a considerable amount. The drives recommended include a number of models tested by APC Labs in our most recent review of CD-R systems (see APC September 1998, page 123).

Most of the drives were quoted at around the \$600 to \$700 price range, and a wide variety of brands were recommended. The majority were capable of 4x CD writing, with a wider variety of reading speeds, although this is less important when you consider how



cheaply you can purchase a fast CD drive. Some vendors mentioned rewritable CD drives (CD-RW). Although the price for these units is significantly higher, they enable you to rewrite onto the same disc many times, which could save you some money in the end.

Most vendors overall could not offer much information about the merits of individual products; the majority simply noted that most drives were available most of the time. This is an acceptable approach to take with a customer who knows what they want, but for the uninformed consumer it presents a problem, as essentially you're left taking a costly punt on an unknown product.

It's important to note that possession of a CD-R drive doesn't automatically give you the right to copy whatever you wish — you still have to follow copyright law. Nonetheless, a CD-R drive does give you the capacity to create your own CDs with your own data, in what is undoubtedly the predominant high-capacity removable data format.

Our charter and method

Price Watch is an exercise in comparative technologies and relative prices. All investigations are conducted anonymously, and records are kept of conversations. Prices and system capabilities printed here are provided by the sales staff at the offices we contacted, and all information is as supplied. While we assume that these are correct, we cannot accept any responsibility for errors or omissions. Neither will we be held to account by companies mentioned here for omissions to product ranges or system capabilities. The responsibility rests with sales staff to provide adequate information, as the company would expect them to do with every customer.

CD-recordable devices

Company	Contact	Product	Price
Harris Technology	(02) 9925 9925 http://www.ht.com.au/	Kodak Digital 4801 4xWrite IDE	\$559
Software Warehouse	1300 300 003 http://www.software-warehouse.com.au/	Sony IDE 2x Write	\$653
		Traxdata CDR 4120 4xW SCSI	\$725
		COMPRO CDR 7582 IDE 4XWrite	\$659
Adelong	1800 626 345 http://www.adelong.com.au/	Kodak Digital 2801 2xWrite IDE	\$599
		Traxdata CDR 4120 4xW SCSI	\$765
		Traxdata CDRW2260 IDE RW 2x Write	\$625
Forte	(02) 9264 4766	Ricoh 6200 2x Write SCSI	\$600
Performance Memory & Peripherals	(02) 9906 4533	TEAC CD55KE 4xWrite	\$872
Computer Market Australia Online	http://compute8.over.to/welcome.htm	Kodak Digital 4801 4xWrite IDE	\$580
		Panasonic CW-7502 4xWrite SCSI w/card	\$670

Where will local technology companies be in a few years' time?

Foreign influence

Judging by the stampede of investors, Australians can't shake their technology gold fever, despite the poor long-term performance of the sector.

The last year has seen a rash of small sharemarket floats of telecommunications and Internet-related companies, as the deregulation of the telecommunications market and outsourcing of IT services has driven incredible growth in the sector. There was the mighty and underpriced Telstra float, Optus and ISP OzEmail (always prone to takeover rumours, it now looks set to fall into the hands of MCI WorldCom), as well as a swag of smaller telecommunications resellers. They were joined in December by Australia's second Internet company to list on the ASX, LibertyOne.

How many investors will pause in the stampede to wonder what will become of their investment in a few years? More tellingly, how many of those companies will still be in Australian hands in a decade?

The truth is, based on past performance of Australian technology stocks over the last decade, few will survive and thrive as listed stocks. Many will become roadkill on Australia's IT&T investment trail.

The dreams of Australian entrepreneurs to grow sustainable, global IT business out of Australia never get far. Few locally owned startups grow to a medium size. Many will fail, or end up merging with a competitor — par for the course in the business. Those that do survive and grow, and opt for public listing, face pretty hefty odds of ending up as foreign companies' takeover targets. Roadkill of another kind from Australia's economic viewpoint.

They end up as fodder for fat US technology companies, which are driven partly by their need to obtain international alliances and global scale. In the latter instance, investors may ultimately win out, but Australia becomes the poorer.

There are a range of reasons for this, from the relative small scale of the Australian sector versus the worldwide market, to the long-term shortages of patient development capital. These reasons are compounded by the lack of understanding by local investment analysts and



institutional investors of technology and its place in the world market. There is little patience in Australia's investment culture for the delays and hiccups that are inevitable in developing business in this sector.

The takeover pace has sped up dramatically over the past 12 months, propelled by the fall of the Australian dollar. This has made Australian technology stocks look really cheap by international standards, and in markets where there is better understanding of market dynamics.

In the US, valuation of technology stocks are typically 20 to 30 times earnings — about double that of equivalent companies on the Australian sharemarket. In other words, US investors can see the opportunity to buy intellectual property at bargain-basement prices. Australia has lost some of its best long-term businesses as a result.

The degree of interest by US investors recently prompted consultants Technology Transactions to list around half a dozen Australian stocks it believed could fall to US raiders. Among them are Techniche, Keycorp, Biotech International, ForBio and Micromedical.

Already its assessment has proved spot on. Two companies have already succumbed. In October, US-based Lucent Technologies wrapped up its \$114 million bid for JNA Telecommunications, and a month later, the Computer Power

Group went to US computer giant Interim Services for \$205 million. A year earlier, George Kepper, founder of the voice and communications company Datacraft, sold his 50% stake to a South African company for \$154 million.

JNA's founder John Almgren and chief executive Peter Davies had sloggled away at the business since the 1960s. Lucent offered \$3.75 a share, an offer too good to refuse.

In these instances, shareholders who had stuck with the company through the long years were richer. In the absence of big local investors who can capitalise on the company's business, it is Australian industry that becomes the poorer.

This has spawned a debate in venture capital circles about whether it is a structural flaw that policy makers can and should address, or whether foreign technology takeovers should simply be accepted as a Darwinian norm. Some venture capitalists argue Australia should accept this fate and focus on nurturing a raft of startup companies, allowing local investors to benefit from capital gains when the businesses are sold to offshore investors.

Computer Power founder Roger Allen has set out to right some of the structural problems which disadvantage Australian technology startups. Allen's venture capital firm Allen & Buckeridge has a high-tech investment fund. It is applying a formula to provide management expertise, staff-share option schemes, and backing from independent boards. The likely goal for the startups backed by the fund will be a listing on the US Nasdaq, making them global from the start. The strategy has worked in the US. The question is whether Australian investors will be inclined to make the jump with them.

Only time will tell. The Telstra float has led to a new crop of hungry small investors who seem eager to try their hand. But they have yet to learn that there can be down-sides in markets and that ultimately there is no substitute for taking a long hard look at the balance sheet and the strength of the business. ■

Trading in cyberspace may be a new and burgeoning phenomenon, but the same old rules will probably apply.

Elaw: The more things change . . .

Business is embracing e-commerce at a staggering rate. However, while business is migrating to the Web, law is still making travel plans. This is because the law of individual states has yet to grasp new technologies, as well as the jurisdictional limits of the law on the Web.

These issues have recently attracted international attention at conferences held by the Australian Competition and Consumer Commission, the Organisation for Economic Cooperation and Development, and the World Intellectual Property Organisation, but it may be a few years before e-commerce is thriving under an international legal regime. One problem at the international level is determining which country's law regulates a contract.

This problem was initially encountered by traders hundreds of years ago when global commerce was in its infancy. It resurfaced again in the 1960s and 1970s when the telephone and facsimile were increasingly used to conclude deals.

Applying the law that developed during these periods offers some clues as to what the courts might do to decide which country's law applies to a transaction. It is also useful to ensure the clarity of the terms of Web site contracts or other electronic communications passing between parties before contract formation. This is because contracting parties have always been free to choose the law of a particular country to regulate their relationship.

However, for a choice of law clause to be effective, it must be incorporated into an econtract. The basic problem with econtracts is evidence relating to both the terms of the contract and a party's consent to those terms, that is, by digital signature or some other mechanism showing their consent.

Contract law requires each term of a contract to be brought to the attention of the other party before that party signs the contract. This normally happens by giving a written contract to the other party or explaining the terms of the contract. Failure to notify a party about a term means that term is ineffective. To ensure that terms are incorporated in econtracts, contracting parties can use 'clickwrap' techniques to draw the other party's attention

to the contract's terms. If these techniques are likely to draw the attention of the another party to the terms before it purchases goods or services from a site, those terms will form part of the contract.

Table. Outlook for e-commerce turnover in perspective, 1997-2005
US dollars billions

	Current 1997	Short Term 2002	Future 2005
E-commerce estimates compared with:			
US catalogue sales	26	330	1,000
US credit card purchases	79	107	128
US direct marketing	670	1,401	1,565
	1,226	1,881	2,390

1. Estimates
2. Based on growth of 6.3%
3. Based on Visa and Mastercard US charges in 1997 and 1996/97 rate of 10%
4. Based on 1996/97 growth rate of 8.7%

Sources: OECD, Direct Marketing Association

Ultimately, the terms that will apply to an econtract depend on many factors, including how well an e-commerce site is designed and the manner in which terms are drafted. Appropriately drafted econtract provisions may, depending on local law, allow a vendor to avoid the implication of terms contained in any applicable sale of goods legislation.

However, assuming Australian law applies, clever drafting will make it impossible to avoid Fair Trading law and the more onerous Trade Practices law. Any vendor should seek specific advice about the exclusions and limitations of liability permitted under legislation. To exceed these will result in the offending terms being invalid.

In order to prove just which terms form part of an econtract, good evidence is required. Encryption (which will be covered in a future issue) allows the use of digital signatures to show authenticity and identify the maker of the digital signature. And while digital certificates, Trusted Third Parties, Data Encryption Standard and Block Ciphers have yet to enter mainstream use, it is only a matter of time before they, or derivatives of

them, will be commonplace in the digital world. Familiarity with encryption alone will increase consumer confidence in econtracts, as well as legal certainty in e-commerce because encryption may ultimately provide better security than paper-based contracts.

However, irrespective of how much progress is made in encryption, at this stage it is still necessary to collect and maintain evidence of your econtracts with other parties. A handy tool to keep track of visitors to your Web site is a log file analysis application which allows you to monitor things such as who entered your site, the duration of their visit and the pages that they actually accessed. This information will provide useful evidence in any dispute you may have with a recalcitrant buyer.

In Australia, though, computer-generated evidence brings with it more problems. You would be safe relying on this evidence in federal and NSW courts. But doubt remains about the admissibility of this evidence in other Australian jurisdictions. UNCITRAL's Model Law on Electronic Commerce is designed to overcome these difficulties, but it has yet to be adopted by Australia or any other country.

The primary reason for the problems I've mentioned is the absence of an international regulating body for e-commerce. In an attempt to fill this void, we will see more and more proposals at an international level regarding e-commerce, and powerful lobby groups will continue to court those in power. Indeed, the December accord on e-commerce between the US and Australia is an attempt to appease those with a stake in e-commerce. But it still does not resolve data privacy or taxation issues such as whether taxation on e-commerce transactions should occur at the point of output or the point of consumption.

So for the time being we will have to rely on traditional legal principles to resolve issues as they arise. An understanding of these principles will allow vendors to take precautions to protect their interests when they are migrating to the Internet.

Leif Gamertsfelder

You can reach Leif Gamertsfelder at leif.gamertsfelder@dgj.com.au.

Discussions are taking place to set up a voluntary industry waste reduction initiative for the computer sector.

Green machines

The worldwide trend that has seen governments ensuring IT manufacturers are accountable for the management of their own waste may have reached Australia. The NSW government has identified the electrical and electronic manufacturing industry as a primary target for waste reduction. It has previously targeted the dairy and tyre industries, developing programs to reduce landfill resulting from their activities.

The NSW Environmental Protection Authority (EPA) has had discussions with key players in the IT industry, as well as waste contractors, to decrease the amount of computer waste and to increase recovery, reuse and recycling. While still in the early stages of development, this is the first sign that an organised and comprehensive program may be set up to reduce electrical and electronic waste in Australia.

Individually, some IT product manufacturers are investing in waste minimisation initiatives. *Return to Sender*, a report written by the National Centre for Design at the Royal Melbourne Institute of Technology (RMIT), notes some case studies of waste avoidance and resource recovery. Hewlett-Packard, for instance, has an Equipment Management and Remarketing Division to aid the return and remanufacture of goods. Fuji Xerox dismantles its photocopying machines and recycles parts through its Asset Recycle Management program. Its Eco Series copier is made from reused, partly recycled and new parts.

However, more organised effort is needed to extend ad hoc efforts to reduce waste, according to a NSW EPA discussion paper on the issue, *Opportunities for the Establishment of Voluntary Industry Waste Reduction Initiatives by the Computer Industry*. It notes that there is a lack of management of any option other than sending goods to landfill, and this poses a danger of leaching heavy metals. The increasingly rapid obsolescence of equipment and the loss of non-renewable resources also adds to the problem. The discussion paper also notes public confusion about how to best dispose of waste, as well as a lack of a coordinated industry approach or even data on just how big the problem is.

Industry needs to make efforts to con-



serve natural resources consumed in the manufacture, use, waste management and disposal of computer equipment; minimise the creation of waste; maximise the recovery of waste; and support the development of new markets for computer-derived waste, it further notes.

Return to Sender notes that in the past, 'green' programs were seen as soft, reactionary and feelgood. Now, however, more companies realise that environmental management is a key strategic business issue that can impact long-term performance. "Companies failing to address environmental performance in product design and development will find it increasingly difficult to be competitive into the next century," said Graham Cavanagh-Downes, director of manufacturing and supply at Fuji Xerox Australia, in the report.

The Australian Information Industry Association (AIIA) is presently considering opportunities for future waste minimisation programs. AIIA technical and regulatory manager, Laurie Ffrench, said members were keen to develop an industry-friendly approach to minimisation rather than have to comply with Government legislation. The AIIA is attempting to determine the scope of the problem and raise awareness of computer waste issues, said Ffrench.

Ffrench added that many multinational companies have well-developed programs internationally; their local branches are aware of recycling and product takeback issues as a result of demands

placed on them by governments in their home nations. The AIIA was looking into an extension of the mobile phone battery scheme being piloted in NSW (see APC January, page 68).

The EPA discussion paper suggests a media campaign to increase public awareness of, and increased participation in, present and future initiatives; the creation of an organised scheme to divert unwanted working equipment to non-profit organisations; the development of markets for computer waste derived material; and the establishment of drop-off centres where individuals and organisations can 'donate' unwanted equipment. Industry-wide takeback schemes, as well as company-specific takeback programs, are also suggested.

Another option would be to set up a computer industry waste reduction body to coordinate programs, according to the paper. This would ensure initiatives are efficient, effective and complementary. One such body, the UK's Industry Council for Electrical and Electronic Equipment Recycling, is setting up a telephone hotline to answer commercial and household questions on computer waste management issues.

Some type of industry levy, perhaps collected at the time of purchase, could fund projects. The Beverage Industry Environment Council collects an industry levy totalling about \$4 million a year from the fillers and manufacturers of beer and soft drink containers on a per rata basis, the report notes.

The Australian Electrical and Electronic Manufacturer's Association (AEEMA) has also had discussions with the NSW EPA, as well as a number of other state bodies, and its national equivalent. One major concern is that there will be a number of uncoordinated state-based approaches, said AEEMA executive director Alex Gosman. "We would like to see a national scheme, and also one that applies to imported goods as well as locally made products," he said. Gosman added that a waste minimisation scheme could include other electrical goods, smartcards and telecommunications products.

Selina Mitchell

What can you do if your machine is accessed by your ISP without your permission? **By Roulla Yiacoumi**

Hard drive hacked — by ISP

When APC's Service & Reliability column received a phone call from an Internet user claiming his hard drive had been hacked into by his ISP, we had reservations. After all, this was something we had heard many times before, but had never seen proven.

What made this time different, however, was that the user claimed he had received a letter from his provider explaining how it had committed the deed. Of course we were interested, but we still had no proof. So we asked the reader to forward the letter to us.

To our utter surprise, there were the words, in black and white. In an email addressed to the user, the provider wrote: "For your information, our network administrator, with very little effort, was able to violate your computer's security and examine the contents of your hard drive in only a few minutes."

We read it and re-read it. Surely no ISP would actually admit it had hacked a user's hard drive?

The name of this ISP? Internet Information Superhighway (IIS). Regular readers will recall that IIS was also the subject of a Service & Reliability column in March 1998 (page 56), when a reader claimed he had been disconnected from the service after complaining about a fee increase.

So, what horrible offence had this user committed that IIS felt it was within its power to violate the user's hard drive? He had installed an option from the Windows 98 CD called 'HTTP Server' (part of 'Personal Web Server'), believing it was some kind of Web site creation tool. When he discovered it wasn't what he thought it was, he left it sitting on his hard drive until he received the heavy-handed letter from IIS which claimed it had "detected" the program on his machine, demanding it be immediately removed. Further, the provider had the gall to tell the reader that "operating such a service without the appropriate sanctions by the authorities offends State and Federal legislation, not to mention breaching our usage policy under our terms and conditions."

Now, we do not dispute that installing this program may have breached the ISP's

terms and conditions. Indeed, it is in every user's best interests to read the online agreement before signing up with any provider and to make sure they understand what they can and can't do. However, to claim having this program offends state and federal legislation is ludicrous. There are no laws requiring users to seek approval before running a Web service. Indeed, when we asked IIS to clarify what it meant by these statements, we received a nasty legal letter — but no answers.

The user told us he had contacted the Telecommunications Industry Ombudsman (TIO) and the NSW Commercial Crime Agency. We contacted both of these bodies to see what they had to say about this incident.

The TIO said that it had received this complaint and confirmed the matter had been referred to the NSW Police's Commercial Crime Agency.

We contacted the NSW Police and spoke to the Computer Crime Investigations Unit. A spokesperson confirmed the matter had been referred to them and had been investigated. Although no further action was taken against this ISP, the police have informed Service & Reliability that they would consider taking action against any ISP that acted with malicious intent, or without authority or lawful excuse in accessing data stored on a computer.

And, of course, we attempted to contact the ISP. As we had previously dealt with this ISP, we sent email to the three addresses we had on our books, but all three came back a day later saying they could not be delivered.

APC's daily news service **NewsWire** (<http://newswire.com.au/>) published the story 'ISP busted for hacking' in November 1998. At the time of posting the story on its site, **NewsWire** wrote that it was unable to contact IIS for comment.

When we later decided to run this story as part of Service & Reliability in the magazine, we again attempted to contact the ISP — this time by fax. We sent a letter and a copy of the **NewsWire** article, inviting the ISP to give its side of the story. We informed the provider that if it wished to respond via Australian Consolidated

Press' lawyers, it was welcome to do so. (*Australian Personal Computer* is published by Australian Consolidated Press.) We requested a written response be forthcoming within one week.

Shortly before this deadline expired, our legal team received a written response from the provider's lawyer. It stated that "Newswire was not unable to contact my client as alleged" (false), that the NSW Commercial Crime Agency had not conducted an "investigation" into its client (we only stated that the police had investigated the matter), and that the user was "publishing pornographic material over the Internet using my client's service" — a claim both the user and police instantly dismissed.

Further, the police added that the viewing and downloading of adult material over the Internet was not illegal (with the exception of child pornography, which was not an issue in this case). If the ISP suspected illegal activity on the part of a user, it is obligated to contact the police and not take matters into its own hands.

The ISP's lawyer demanded a retraction, claiming **NewsWire's** article was "biased, distorted and malicious". It further accused the author of the article (yours truly) of being "involved in a conspiracy to falsely accuse my client of a crime", adding that this in itself is a crime "punishable by penal servitude for fourteen years".

Service & Reliability is a consumer column which seeks to address issues our readers have with hardware and software vendors, ISPs and related businesses. To present both sides of an issue, the vendor is invited and encouraged to respond to the reader's letter — both the complaint and response are then published. If a vendor does not wish to submit a response, we will publish the complaint without it.

We do not succumb to the threat of legal proceedings — regardless of who the vendor is. Our readers trust APC for its unbiased reporting and thoroughly investigated issues.

If you have any comments, drop me a line at ry@acp.com.au.

PC Service & Reliability Survey 1999

Return your form to us by:

- MAIL APC Service & Reliability Survey 1999, APC, GPO Box 4088, Sydney NSW 1028
- FAX (02) 9264 6320
- WEB apcmag.com/service/ and follow the link.

YOUR COMPUTER

Complete this for the PC you access most often. This can be a home computer, work computer, or other.

1. Describe the computer you most often use:

- ☐1 Brand name computer
- ☐2 Clone computer
- ☐3 Brand name notebook
- ☐4 Clone notebook
- ☐5 I built the computer myself
- ☐6 I had the computer built from parts I specified
- ☐7 Other. Please state: _____

2. This machine is:

- ☐1 A home computer
- ☐2 A work computer
- ☐3 A home computer which is sometimes/regularly used for work
- ☐4 A university/school/library computer
- ☐5 Other. Please state: _____

3. What is the brand of this machine?

- ☐1 _____
- ☐2 No brand name appears anywhere on the case

4. What kind of processor does this machine have?

- ☐1 486 or earlier
- ☐2 Intel Pentium or Pentium MMX
- ☐3 Intel Pentium II or Intel Celeron
- ☐4 Intel Xeon or Pentium Pro
- ☐5 Cyrix
- ☐6 AMD
- ☐7 Other. Please state: _____
- ☐8 Don't know

SHOPPING

5. How was this machine purchased?

- ☐1 It was bought new from a retailer
- ☐2 It was bought new, built using chosen components
- ☐3 It was bought second-hand
- ☐4 I don't own the computer
- ☐5 Other. Please state: _____
- ☐6 Don't know

6. Which retailer was your machine bought from?

- ☐1 _____
- ☐2 Different bits came from different retailers
- ☐3 Don't know
- ☐4 This question does not apply to me

7. Why did you choose this particular retailer?

- ☐1 I saw an advertisement
- ☐2 It was conveniently located
- ☐3 I wanted to buy from a major retailer
- ☐4 It was recommended by someone
- ☐2 It had the best price
- ☐5 I searched on the Net
- ☐6 I had previously bought goods there
- ☐7 Other. Please state: _____

8. When was the PC or the last upgrade component purchased?

- ☐1 Within the last three months
- ☐2 Within the last six months
- ☐3 Within the last year
- ☐4 Within the last two years
- ☐5 More than two years ago

9. Do you intend to buy another PC or component soon?

- ☐1 Yes, within the next few weeks
- ☐2 Yes, within the next six months
- ☐3 Yes, within the year
- ☐4 I have no plans to make such a purchase.

Yes, it's that time of year again! Here's your chance to tell us everything about your PC and your purchasing experience. Complete this one-page survey and return it to us by Friday March 5, 1999. Feel free to attach any additional comments on a separate sheet. You'll be in the running to win a bunch of fantastic prizes!

SUPPORT

10. Have you ever had to contact customer support for this product?

- ☐1 Yes
- ☐2 No
- ☐3 Can't remember

11. How would you describe the support you received?

- ☐1 Excellent
- ☐2 Very good
- ☐3 Satisfactory
- ☐4 Poor

12. Has the equipment ever been unusable?

- ☐1 Yes
- ☐2 No
- ☐3 Don't know

13. If the product was repaired, was this done by:

- ☐1 Manufacturer
- ☐2 Retailer
- ☐3 Technician
- ☐4 Myself
- ☐5 Someone I know
- ☐6 Other. Please state: _____

14. How would you rate the equipment for overall reliability?

- ☐1 Excellent
- ☐2 Very reliable
- ☐3 Satisfactory
- ☐4 Poor

15. Would you buy equipment made by the same manufacturer again?

- ☐1 Yes
- ☐2 No
- ☐3 Not sure

16. Would you buy from the same retailer again?

- ☐1 Yes
- ☐2 No
- ☐3 Not sure
- ☐4 They are no longer in business

17. Did you complete APC's PC Service & Reliability Survey last year?

- ☐1 Yes
- ☐2 No

Enter now and WIN!



Epson Stylus Color 740
worth \$599

PLUS



Iomega Zip USB
worth \$349

PLUS

One-year subscription to *Australian Personal Computer* worth \$65 each

We have five prize packs worth over \$1,000 each to give away to five lucky readers. Each pack contains an Epson Stylus Color 740 printer, Iomega Zip USB drive, and a one-year subscription to *Australian Personal Computer* magazine. To be in the running, simply get your completed survey to us by Friday March 5, 1999 and tell us in 25 words or less what the worst IT product you ever bought was and why. Winners will be contacted directly by APC and will have their names published in our July 1999 issue.

ENTRY DETAILS

To complete this survey and be in the running for our prizes, please fill in the following details and answer our question:

Name _____

Daytime phone number _____

Address _____

Suburb _____

State _____ Postcode _____

Email _____

Question: What is the worst IT product you have ever bought and why? _____

NOTE: This survey is open only to Australian residents. You will only be contacted if we need to seek clarification to one of your answers or to conduct an authenticity check. Your personal details, including address and phone number, are for APC's exclusive use. They will not be passed on to any third parties. All surveys become the property of APC. We reserve the right to publish any comments made by individual readers in our reporting of the survey results.

PROFILE

BY SIMON VANDORE

Easy Rider 2000

Time is not on our side. I missed my bus stop and sprinted back uphill to the Intercontinental, cursing my business shoes, wondering if the perspiration would show. But my contact was also delayed — Greenwich Mean Time marketing director Doug Garske had been hunting for a working ATM to pay his cab driver. A theft overseas meant he had had to borrow a mobile phone, and nobody knew the number . . . making the juggling of appointments chaotic.

Karl W Feilder, international Y2K guru, wasn't quite ready either. Garske eyed the elevators for several minutes, until a slightly unshaven guy in an open-necked shirt stepped out to shake my hand. For some reason I had expected a grey-haired English gent, but Karl Feilder is in his early 30s and speaks with a South African accent. He's tall, broad and definitely not a 'suit'.

The hotel staff led us upstairs to a quiet bar. It was 10am, but Feilder ordered a drink and lit a cigarette — Sydney was probably his third time zone of the fortnight, and he does have an image to keep up. As recently as 1996, Feilder was "doing the 'Easy Rider' thing" in southern Africa with Harley-Davidson bikers the Johannesburg Steel Wings — he owns a 95th anniversary Road King Classic and a 1989 Low Rider Police Special. In his Web site bio, GMT staff remember him "dressed in his Caterpillar walking machines and Harley-Davidson colours, singing his passionate heart out on darkened pub stages".

The sale of intellectual property developed by Feilder's first company, Network Managers (UK), to Microsoft in 1995 left him with an impressive bank balance and he moved to South Africa as a kind of retirement. But his mind wouldn't obey his heart's desires. At Network Managers he'd discovered the extent of the Y2K problem on PC clients and servers, and one day in Botswana he decided something had to be done.

Greenwich Mean Time, named the night it was formed, was the first company to really jump up and down about an impending millennium mess on the desktop, as well as within legacy systems. It publicised Feilder's mantra that there are five layers to Y2K on PCs: hardware, operating system, software, user data and data sharing. GMT's flagship product, Check2000 Client/Server (there's also a cut-down version called Check2000 PC), is a suite of testing and reporting tools with incredibly thorough

documentation. It competes with other high-fliers like Viasoft's OnMark 2000 and MFX's Australian-developed Millennium Master. Novell recently incorporated elements of Check2000 in Z.E.N.works, its set of NetWare administration tools.

GMT has 150 staff and maintains nine offices worldwide — Feilder, president and CEO of the private company, constantly travels between them



and to other countries, addressing audiences and governments. He is an advisor to the Y2K task forces of Britain and South Africa, as well as Australia's year2K program. "I'm one of six authorised spokespeople for them, which is a bit funny, being a Pom and all," Feilder said. He has also briefed various sections of US Government and the World Bank.

Business is booming

Feilder was soon due for a radio interview — curiously with 2KY, a station that specialises in horseracing (did they confuse their callsign with Y2K?) — but took a few APC questions first, during which he emphasised the scale of the problem.

"We reckon that we've probably sold between one and two million copies of our software . . . [But] we've probably checked, in total, about four million PCs out of a world population of 400 million. We've done maybe 1%, maybe 2%."

"We're virtually doubling in turnover, which is probably the same as [saying] the number of licences shipped, about every month. So we're going through a mammoth explosion, but even if you extrapolate that up, we don't think we're going to be able to get to

In the coming months, when the millennium bug sizzles or fizzles, Karl Feilder may be seen as either a prophet or a charlatan. Noted for being the first to spot the Y2K problem on PCs, he is currently reaping the rewards. He's also made a few predictions . . .

more than about 15% or 20% of the market," he said.

GMT's focus from day one has been researching the compliance of PC software and hardware through its testing laboratories (headquartered in Cape Town). This data is added to its software and used to provide detailed, contextual advice to those attempting repair (users receive specific instructions relating to their software and the data it created). The company initially estimated that 47% of tested PC BIOSes had failed, while only 28% of 4,000 software packages had claimed compliance. GMT has now tested over 5,000 applications and estimates that 64% fit at least one of its 75 definitions of year 2000 problems.

Short-term business success is all very well, but does Greenwich Mean Time have a role beyond the millennium?

"I think the peak demand is actually going to be during 2000," said Feilder, "because I think that most small businesses won't do anything about it until it hits them. The problem there is that in many cases it will be too late by that stage. By the time we've analysed what their problems are, they will have been unable to invoice their customers, unable to get paid and unable to pay their staff for probably a couple of months . . . So I think that a lot of companies will, if they don't take action now, go bust as a result of year 2000.

"This isn't about 1/1/2000. The year 2000 problem has started to affect businesses already. I'm sure you've noticed that there's a global slowdown in the economy. That some of the traditional high-selling hardware and software companies are noticing decreases in their revenue, and these are year 2000-related things. Sure, the Russian crisis doesn't help, but on a global scale we are already seeing the impact of year 2000."

Such Y2K-induced economic lethargy, Feilder predicted, will reduce the uptake of new technologies: "Sooner or later the business managers kick in and they start telling the IT managers 'You can't have any new toys because you don't have the budget for it'. Year 2000 is not optional — all these new things are optional. Why do we need ecommerce? You know, because it's faster and quicker. But are we doing business already? Yes, of course we are. So I think it's going to have a mammoth effect on those things; they will be delayed or put off by one or two years."

On the other hand, Feilder gave Australia a glowing report for its Y2K preparations so far. But aren't we vulnerable to the millennium readiness of trading partners?

"Yes, in terms of what Australia can do

for itself, it's doing pretty well. In terms of how much influence you can have over some of your major suppliers, that's a bit more tricky. Although I believe the largest supplier of goods and services into Australia is actually the US, and then the UK comes in fairly close underneath that, and Japan is in the top three as well. Japan is slowly getting sorted out with year 2000, but some of the other Asian countries are a long way away from being sorted out."

Ring, ring

Miraculously, the radio station found Garske's mobile number, the call was redirected to Feilder's hotel room and the guru strode off towards the elevators.

Peter De Jager may be considered the world's leading millennium bug expert, but Feilder is a charismatic presence. At one point during the interview, hotel staff started shifting chairs and tables nearby. When all three of us asked them to pipe down, it was Feilder to whom they listened. He returned after 15 minutes on talkback radio, and it was time to ask a question about Sydney 2000. Feilder had a potent message.

"I can't see any way that the Olympics is going to go ahead as planned," he said. "The Olympics revolve around the prospect of getting people from every country in the world together and competing. Now, Australia, in case you hadn't noticed, is actually a long way away from many places in the world.

"When I flew here over the weekend, I left from the UK, I flew over the North Sea, into German airspace, across Russian airspace, through Afghanistan, into Burma, into Thailand, left Thailand across Singapore, Indonesia, and then down into Australia. The only two countries that I think will be sorted out in air traffic control are the UK and Australia. So how the Dickens do I get here?"

But surely Germany is more organised than he presumes? Feilder shook his head.

"The Germans are way behind — they seem to think that the year 2000 problem is still a myth. They're certainly a year behind in their understanding of the severity of the problem. [Y2K repair for] air traffic control in America has taken so far about three and a half years and they're pretty comfortable that they will be finished in time. If [they started] three and a half years ago and they're gonna be finished now, that means that their project took them about four and a half years. If the Germans haven't started yet . . . we don't have four and a half years left to go. The same goes for the Russians — the Russians can't

believe that this is a problem. They say they don't have the money to address it anyway.

"I think the overall domino effect will conspire against the Olympics occurring as they should. It won't just be transportation, it will be the fact that in some countries maybe the aircraft will be flying, but you won't be able to drive to the airport because something will be wrong with the traffic system."

But the Olympics is happening in September — surely nine months is enough time to get air traffic control operational again?

"Well, we've been working on the problem for three, four or five years now — there's nothing that leads me to conclude that if you start in January 2000 you're going to be finished by August. You know, if anybody could fix it that quick they'd already have done that. A lot of countries, as I said at the start, I don't think will address this until it really hits them hard."

Later, APC sought some reactions to this assertion. SOCOG gave a firm "no comment" on Feilder's predictions, but said it "will be issuing a statement". Catherine Pawle, national marketing manager for the year2K program, denied Feilder was an official spokesperson, but said he did meet regularly with year2K as part of its information gathering efforts because he was important on a global scale. Pawle said Feilder assured her his comments were in the broader context of contingency planning — year2K emphasises that all organisations must think through the worst-case scenario.

Millennial spring

Is he just scaremongering to drum up business for Greenwich Mean Time?

"No. I just tell it how I see it. I don't want to scare people at all, I want people to realise how severe the problem is, not to panic about things that they can't control — so there's no point in worrying about the electrical supply, or the telephones here in Australia. There's plenty of people already working on that. What you need to understand is that things that are within your sphere of control, you must look at. You must check every single PC and you must address the mission-critical systems.

"It doesn't mean fixing everything — it's too late to fix everything, and everything doesn't need to be fixed. We've got too much technology as it is; this is a chance to have a good spring-clean."

Is this evidence that deep down Feilder is really a Luddite? Should you ever find yourself in a computerless, post-millennial wasteland, watch out for the Harleys. ■

Going for Gold

BY SIMON VANDORE

The athletes round the final bend with 150 metres to go, past another Telstra advertisement and a distracting Kodak sign. The crowd watches close-ups of runners' faces on a huge screen that reads 'Panasonic', while a corner of your own TV screen is taken up by a Swiss Timing logo. The Nigerian athlete crosses first, followed by an exhausted Korean. The picture follows the winner on her victory lap as a commentator relates her life story, but . . . the Korean woman collapses and medical officials rush in from all sides! A camera crew is on the spot and we see her trying to catch some breath, propped up against a Xerox hoarding. But she's all right, she waves the medics away, and after the official results are posted onscreen, it's time for yet another IBM ebusiness ad.

Like it or not, this is a typical '90s Olympic scenario. IT companies are everywhere, and we can now expect to see their logos at these events. But it goes much deeper — the Olympic Games is one of the biggest IT projects on the planet. Have you ever wondered how the commentator knew so much about the Nigerian, how such detailed results appeared on your screen, or what the hell ebusiness had to do with athletics?

You only need to take a look at the technology used at the Nagano Winter Games to get an idea. These Games featured traffic analysis systems to prevent congestion, real-time radar weather reports, high-definition television (HDTV) screens with 3D images, hypersensitive microphones beneath the ice rink, an Olympic torch that ran on propane, and a high-tech doping test lab. The Olympics are a technology showcase, and it follows that Sydney should be the biggest ever.

SOCOG's (Sydney Organising Committee of the Olympic Games') general manager for technology, Dennis Lock, has been described by SOCOG's CEO, Sandy Holloway, as "the single person you can hold responsible for anything to do with technology and the Games". The role has been compared to running a highly diversified business with 80,000 employees, integrating IT from different suppliers across all business functions.

A former Air Force engineer officer who spent six years with IBM, Lock's recent experience is with Computer Science Corporation (CSC) as an IT project management consultant with vast experience. Sydney 2000 sees him working closely with Big Blue again. Despite problems in 1996, IBM retains the mantle of systems integrator for the Olympics and Paralympics, making sure the contributions of all the companies involved



Backstage



They may be working towards one of the biggest visual spectacles in history, but none of the Olympic IT figures interviewed by APC will see much of their Games. Even SOCOG's IT manager, Dennis Lock,

dreams of perhaps leaving his technology command centre to catch a little swimming or diving — but only if he's confident things are running well.

Lock's colleague, Stephen Dettre, ran media centres for the World Youth Soccer Championships in 1993 and still hasn't seen the final. "That day it was a full house, there was a full media [contingent], there were all sorts of

dramas with things happening. My job was to make sure that the 200 journo's who were there could do their job. I accepted that, and that's cool by me. I actually get a bit of a kick out of providing that sort of thing.

"And the same thing during the World Swimming Championships — I never saw one swimming event . . . We got [the volunteers] to work on different shifts, so they could go and see either a morning session or an evening session. But we convinced them as well, that what they were doing was really important."

Rory Mack worked for IBM in Nagano. "I saw a quarter of an ice-hockey game and the closing ceremony," he said, predicting that once again he would spend many hours running technology tours for Olympic VIPs.

Colleague Geoff Hegarty only caught two events in Nagano, but takes consolation in his job, which involves showing customers replays of his favourite contests several times a week.

work together seamlessly. This time it will be handling even more than usual — SOCOG has subcontracted its internal IT requirements to the company.

Lock does not see any problem with placing all his eggs in one basket. "It means I'm dealing with a single organisation, a single set of people," he said, "and it probably makes it easier to do things than having to remember 'this is with one firm, and that's with another firm'."

SOCOG's mission statement is to deliver "the most harmonious, athlete-oriented, technically excellent and culturally enhancing Olympic Games of the modern era". To do this, it expects to raise \$800 million (of its \$2.6 billion budget), 60% of which will come from sponsorship deals with its 'Team Millennium Olympic Partners' (premium-level sponsors). Among them are the companies that will handle the Games' technology requirements, through arrangements variously described as "mutually beneficial" and "in lieu of currency".

The full Team Millennium list includes Coca-Cola (non-alcoholic beverages), IBM (information technology), Visa (consumer payment systems), John Hancock (life insurance/annuities), Xerox (document publishing, processing and supplies), UPS (express mail, package delivery), Kodak (photographics and imaging), Samsung (wireless communication), McDonald's (retail food services), Panasonic (audio/TV/video equipment) and *Sports Illustrated/Time* (periodicals, newspapers and magazines). Each sees the Games as a way to display its wares, despite the possibility of huge public embarrassment — if something goes right, people continue to enjoy the Olympic Games, but if it goes wrong, the spotlight turns on the culprit.

"We weigh up the risk and weigh up the benefits, and look at the return on investment and all the

other business decisions that one needs to make in deciding on any project," said Rory Mack, director of IBM's Olympic Project office in Sydney. Fuji Xerox, on the other hand, pointed out that being associated with the "high values" behind the Olympic movement is worthwhile in itself.

But this time, things may be a little quieter on the technology front. SOCOG, which runs most tasks on Lotus Notes, has put the emphasis on proven technology rather than flashy displays of the latest ideas. For example, in many areas SOCOG has required Lotus to meet its development needs using only shrink-wrapped

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Awry in Atlanta

When asked what was so bad about Atlanta, one former XXV Games participant simply replied, "Atlanta happened."

Many remember Atlanta for its tacky commercialism — the Coca-Cola sponsored basketball displays and the ugly prevalence of corporate logos on shirts, hoardings and Games memorabilia. Others remember it for the tragic bombing. But those who attended most often speak of the serious organisational problems. At the closing ceremony, when International Olympic Committee (IOC) president Juan Antonio Samaranch described Atlanta as a great Olympic Games, it was taken as a snub — he is expected to describe each successive Olympics as 'the greatest Games ever'.

IBM, with the Atlanta Organising Committee's seal of approval, made its greatest mistakes in the worst possible area — the communication of results to the media. Thus the world saw front page headlines about technological 'disasters' at the Games when it expected reports of gold medals.

It's important to remember the time frame, however. In 1996, the US was in the grip of a new media fever pushed by the Internet revolution. Techno-evangelists such as those behind *Wired* magazine promoted networking technologies as fashion items and the concept that higher bandwidth made for better results. It was logical to push the envelope at the Games, because that's what everyone else was doing.

SOCOG's Stephen Dettre, who worked for Australian Associated Press in Atlanta,

now has the responsibility of getting right what his predecessors got wrong. Even with a PalmPilot in front of him ("I'm the greatest lover of gadgets in the world — I've got everything that moves, tweets and beeps at me"), he's not afraid to admit technology can be a problem.

"I think greater minds than mine have tried to find out what happened in Atlanta," said Dettre. "My view at the time, as a journalist, was that it was a combination of factors both within [and] outside their control... Plus people's expectations of what promoting technology can achieve were sort of racing ahead of what it actually could do."

Shellshocked by Atlanta, the IOC set up a new body known as the Olympic Results and Information Service (ORIS, consisting of the IOC, international sports federations, the incumbent organising committee and media representatives). It is responsible for examining the needs of each party and ensuring they are met. The idea is to break down the barriers between sport, IT and the media. ORIS's first Games was Nagano, where things went well enough that an IOC delegate cheesily praised all the technology companies involved for "a gold medal performance".

But after Atlanta, IBM had to issue formal apologies to the news agencies it had inconvenienced. During the worst times in the first week of competition, the results part of Info96 was 12 hours out of date, while the Olympic Web site's servers couldn't handle their huge load. There

were also data problems, with bizarre errors in athlete profiles, and in the results systems for display events.

IBM's official line is that Atlanta "had some hiccups" from which the company has learned, but that otherwise it went very well indeed. The company points immediately to Nagano, having given Sydney a "clean slate", though it does admit that a Summer Games is on a completely different scale.

To further make up for its errors, IBM put the same levels of human resources and cash into its Nagano effort as it did for the Summer Games. Fortunately, it was the most widely covered and watched Winter Games ever, meaning a great deal of positive publicity came out of its commitment.

"We can be pretty brutal about Atlanta," said Dettre. "But having said that, Atlanta was inevitable. And if it hadn't happened at Atlanta, if they'd somehow managed to struggle through, it would have been the next Games — it could have been us... I think [the Atlanta Organising Committee and its IT partners] thought they could solve the problems with technology. And I think one of the great lessons that we've learnt, and what is in place here, is that technology alone is not the answer... People are the answer, procedures are the answer. And that's what ORIS looks at — rather than having a high-speed ISDN line from this room to the next, wouldn't it be easier to go over to the door and say 'Hey, it's ready?'"



Hundreds of networked touchscreen terminals will feed results from all 28 sports to commentators.

commercial software. The belief is that if it's available off the shelf, it's being tested constantly and its flaws are known. Custom-built programs, though potentially more exciting for IBM's Lotus team, are definitely out. It's also quicker and easier to train volunteers on a system using commercial applications they may already know.

To an extent, this follows a precedent set in Nagano. Outwardly, the Winter Games was a technological extravaganza in the best Japanese tradition, but beneath the glitz was IBM's recovery from its mistakes in Atlanta. Likewise, all the software Lotus is developing for Sydney 2000, for example, has its roots in the new genera-

tion of applications built prior to Nagano.

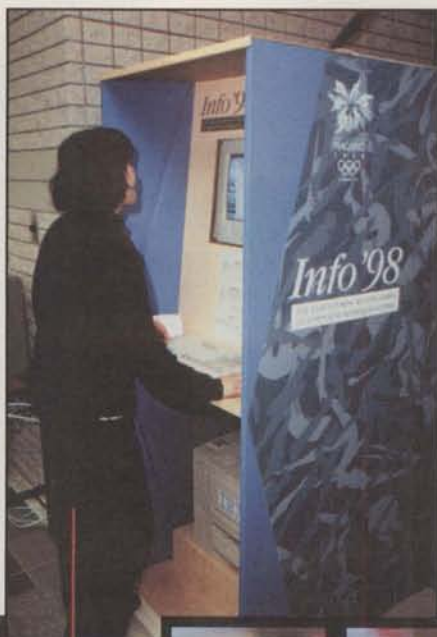
"You know the old hackneyed phrases," said Geoff Hegarty of IBM's Olympic Project Office, "likening it to an athlete trying on new running shoes the morning of the 100m dash — you don't do those sort of things, you use what is proven and what got you through the heats and

the semis to the finals. You don't stick new shoes on. We will be using proven technology and SOCOG [is] adamant that that is the case, as is IBM."

Failure is not an option

Each technology partner supplies one representative for fortnightly meetings with SOCOG's IT managers. There are also quarterly meetings of the Technology Partner Council which resolves any major issues, such as problems arising during test events.

"A hundred days out we'll have a set-up and test of a range of things, to make sure the infrastructure end-to-end is right," said Lock. "We'll have, 50 days



The Info98 system in Nagano had processed 6,532,018 transactions by the time it was taken offline.



out, complete set up and rehearsals, and then from about 20 days out we want to have [more] rehearsals. So by the time we actually get to the Opening Ceremony, we've practised, we've tested, and we've rehearsed the thing end-to-end with the volunteers and the whole lot, and that should take a lot of the risk out of it.

"One of the things that we're also doing, which is different to how other Games in recent history have done things, is we'll be setting up what goes into the venues in test labs here in an IBM building that's been put aside specifically for the purpose. And that will include equipment from all of the suppliers we have, and that will be tested exhaustively, and then the systems taken and plugged into the cabling and so on that's already in the venues."

At the time of writing, IBM would not disclose the hardware it will be using — its decisions are due to be announced shortly before our publication date. The focus until now has been on software development, because this is generally where potential problems lie. Problematic hardware can be removed and quickly replaced with something better,

while the operating system and software remains the same. Tracking down and fixing bugs in software, and then distributing new code to servers, is much more difficult.

"The secret of success with any project is to plan well up front," said Mack, "and to take time in the development and to test, test and test again to make sure that the day the curtain goes up that... you can perform to the best of your ability."

"I've seen a lot of projects, excluding the Olympics, where people — and I must admit, I've been involved in this myself in projects with IBM — keep adding and adding and adding, and the definition and requirements statement gets bigger and bigger and the project becomes larger... And then the temptation is to rush it, or to take shortcuts, and the invariable end result is disaster."

Software development was due to finish at the end of last year. IBM and Lotus will now rely heavily on SOCOG's planned series of test events. These events are due to take place in Sydney over the next 18 months and include international sporting competitions, during which the Olympic systems will be used and abused.

If you look at IBM's hardware commitment at Nagano, you will have an idea of what IBM will be using in Sydney (especially when you bear in mind SOCOG's requirement for proven technology). During the Winter Games, 4.6T of data were processed on over 5,000 PCs, ThinkPads and servers, 18 RS/6000 SPs, two S/390 mainframes, five AS/400s, all run by about 800 staff. IBM gleefully points out that this equipment operated in the vicinity of two snowstorms, two thunderstorms and an earthquake.

Atlanta had four mainframes, 110 AS/400s, 7,000 PCs, 2,000 wireless terminals, 250 LANs, 500 data lines and 3T of data in 100 applications.

Living colour

IBM is not the only one forging ahead.

Fuji Xerox, for example, is responsible for SOCOG's document management needs. This includes event programs, conference notes and newsletters — already at 500,000 pages per month and expected to grow to nine million — as well as high-speed, full-colour results sheet and book printing. Its audience will include all broadcasters, media and officials. It is also required to train users (officials, volunteers and support people) to run its technology. It will provide 170 million pages, 230 results printers, 800 digital copiers, 800 fax machines, 150 engineers and six to eight DocuTechs (high-volume printers) in a purpose-built publication centre.

Xerox was involved on a similar level at the Lillehammer and Atlanta Games, but has been an Olympic sponsor in one way or another for 30 years. In 1964, Xerox provided seven-page-per-minute copiers, each equipped with a fire extinguisher! This time, in line with the green theme of Sydney 2000, the company is required to document as much as possible digitally. The challenge here is to achieve this without

The Hegarty show

In the outer suburbs of Sydney, at its West Pennant Hills corporate headquarters, IBM maintains an Olympic Project Office and demonstration centre, with working examples of all Olympic systems. The idea is to show off its systems integration achievements to potential customers.

Geoff Hegarty, executive briefing centre manager of the Olympic Project Office, is clearly passionate about sport. He can recite the date, Olympiad and city of each Games — outside work, he's in demand at community club meetings as a guest speaker, because everyone is fascinated by the histories he can recite.

"We have a very long and proud heritage with the Olympic movement," said Hegarty, "from the time that computers 'came of age' to have any relevance to an international sporting event, still back in the days of punch-cards with massive, clunky printers. Squaw Valley, California, Winter Olympics 1960, was the first time that computers had any relevance to a sporting event. And we've been involved right through from there, almost every Games, summer and winter."

Until the early '90s, Hegarty said, IBM's Olympic effort was simply a remake of what it had done before, with a few technology advancements. But in 1993, just after Barcelona and Albertville, the company signed a longer-term contract with the IOC to provide its IT needs until 2001.

"And it was no longer a reinvention of the wheel," continued Hegarty. "There was an evolution of the technology where it was relevant from a baseline of Barcelona. So, some of the systems that had been developed for the Barcelona games were done by small joint ventures between IBM Spain and Spanish universities."

The result is that ever since Barcelona, IBM's Games Systems Centre has been based in Madrid. Integration testing between all Olympic technologies is done there. Work towards Sydney 2000 is also being done by IBM in the US and IBM Australia, but SOCOG officials and IBM Olympic staff liaise constantly with the team in Spain. A number of the centre's members are Spanish, but the group is quite international. It includes several Lotus developers from Australia who worked on Info98 in Nagano prior to the Winter Games, and who have since moved their lives and families to Madrid. SOCOG officials, particularly Stephen Dettre, are full of praise for this team's responsiveness.

Prior to the Barcelona Games, IBM found itself working with two major partners in Sema Group, a huge international systems integration and consulting firm based in the UK and France, and MSL, a Spanish company whose entire focus is on providing sports results systems around the world.

"If you look at the Commonwealth Games, if you look at the Bangkok [Asian] Games, you'll find Sema and MSL are in both places, working with Swiss Timing and so on," said SOCOG's Dennis Lock. "So rather than IBM doing things from scratch... they're leveraging the Games experience of these other companies. IBM absolutely and clearly is accountable end-to-end for what happens and I'm confident they'll do a very good job."

Various Australian IT companies have approached SOCOG offering their services, and they have been redirected to IBM, which is working loosely with the Federal Government's Australian Technology Showcase to potentially subcontract a few local firms. At the end of the day, though, almost everything is shared between SOCOG's major sponsors, and there are few opportunities arising.

However, IBM's sponsorship agreement with the IOC expires at the end of 2000. In early September last year, the company announced it would not take up an option

contract of which IBM has been so proud — a role that will last until at least the 2008 Olympics. Sema has been involved with the last two Mediterranean Games, soccer's World Cup 94 and Euro96, and the Kuala Lumpur Commonwealth Games last year. Its Olympic team is still based in Madrid.

A SOCOG spokesperson speculated that IBM might still take part, possibly as the hardware or software provider, but IBM itself was non-committal.

Hegarty's display room contains the Commentator Information System (CIS) used in Nagano, and it will be used again in Sydney (Nagano had 937 of them). On one side, a commentator has a Panasonic television which shows what the audience sees, on the other is a touchscreen terminal, which displays information such as on-the-fly comparisons between competitors' times, calculations of what the current competitor requires to win, and biographical information. The system is designed to be as intuitive as possible, with a response time of under one second.

Next to this system is a results and statistics display which will be staffed by technical teams at more conventional mouse-and-keyboard terminals. It offers mountains of automatically generated data from all 28 program sports, which can be compared, cross-referenced and

fed to commentators on demand.

The sort of information collated here might include the way goals were scored during a match, how many fouls of what type were committed, and which players appear to have contributed to specific occurrences.

Audience members are input as participants and information is shared between all systems, meaning that by the end of Hegarty's



to continue. The parting is amicable, but IBM admits its reasons include diminishing return on investment.

The IOC has since decided to split the ever-growing IT effort into sections awarded to individual expert companies. On December 7, it was announced that Sema Group had been awarded the systems integration



tour, you've won the downhill, raced a bobsled and scored the winning goal for an ice hockey team from Chad.

alienating those who live by voluminous hard copy. There's an emphasis on low power consumption, while the paper used will consist of 15% waste from the cotton seed industry, 35% pulp from sustainable plantations and 50% recycled paper.

To a great extent, Fuji Xerox will depend on the reliability of Telstra's communications infrastructure and IBM's data-processing capabilities. On the other hand, this is one area where it pays to use recent digital technology, rather than old standards — Fuji Xerox Australia chairperson David Stringfellow predicted faster page per minute (ppm) rates by 2000.

"For Olympic results printing we should be up to 180ppm in black and white and highlight colour, and for customised continuous printing we are looking at Xerox equipment outputting at speeds of 400 A4," he said. "This means that what we produced in the way of results printing for the Atlanta Olympics, we anticipate we will be producing in full colour by the year 2000."

Much of that colour will come from still photography, for which Eastman Kodak will juggle several roles. Primarily, it must serve several thousand of the world's press photographers by constructing the Sydney 2000 Image Centre (housed in the Main Press Center — MPC) the biggest photographic laboratory ever built. This will provide all processing services for accredited photojournalists via C41 processing machines, together with a free replace-

these product introductions since we have such a broad and varied audience of elite photographers at the Games," he said. "It is interesting to speculate what proportion of images are captured on conventional film, and what proportion via digital cameras."

Working with Telstra, Kodak will arrange for the transmission of digital images on demand. The company will also work with IBM to provide about 200,000 photographic ID badges (including those for 15,000 media and all Sydney's volunteers — 40,000 at the Olympics and 10,000 during the Paralympics). Installations will be in place at Australian airports so that arriving Olympic participants can immediately

the Sydney Games involves providing all these services *and* paying the International Olympic Committee (IOC) a significant sponsorship fee — as it did for the Nagano Games. Olympic street-cred does not come cheap.

Swiss Timing, under its Swatch moniker, is responsible for photo finish systems. Its traditional Games' role is to provide timing system, which are capable of separating images of athletes to within thousandths of a second, and sending streams of data to results systems.

Moving pictures

The Sydney Olympic Broadcasting Organisation (SOBO), commissioned by SOCOG, is required to televise about 3,200 hours of competition, spread over 290 events, for 180 broadcast organisations (serving just under 10,000 rights-holding broadcasters). It will have 50 outside broadcast units and will require about 700 cameras, 400 VCRs and 3,200 personnel.

Panasonic is responsible for arranging this technology, supplying DVCPRO 50 digital VCRs and digital broadcast cameras, audio systems and TV monitors. The VCRs can switch between PAL and NTSC video formats to suit journalists from anywhere in the world.

SOBO's International Broadcast Centre (IBC) is to be the largest broadcasting facility in the world, catering one way or another for 10,000 broadcasters during the Games. Closer to the Olympic Stadium will be the MPC. It contains an 800-



Director of IBM's Olympic Project Office, Rory Mack, said the company would not be taking any shortcuts.



ment film service for those shooting Kodak stock. Canon and Nikon will provide camera loan and repair.

A spokesperson for Kodak's New York-based Olympic team said the company customarily introduces new professional film technology at each Games, but in Sydney, it would also most likely introduce new high-end digital cameras.

"The Olympics is a logical platform for

be issued with their ID, while for those within Australia, Kodak Express stores will do much of the work.

For medical authorities, Kodak will also coordinate radiological and teleradiology services inside the Olympic village, and provide facilities for specialists at that clinic to remotely examine injured athletes at other Olympic venues.

Believe it or not, Kodak's contract for

seat press room with a huge number of video displays which feature live video and computer data, and is due to open in August 2000. In theory, the MPC's function is to provide the information, access and communications systems that media representatives require. There will be more Info2000 terminals here than at any venue or landmark, while a digital photo transmission workroom will be

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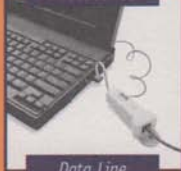
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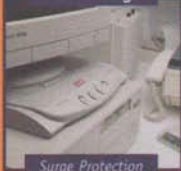
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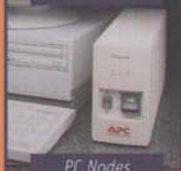
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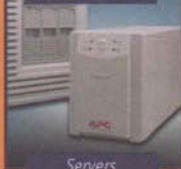
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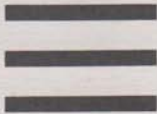


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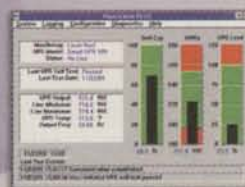
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Inside the main stadium itself, Panasonic Australia will install two 135m² Astrovision screens — each 35% larger than those used in Atlanta — which will be left in place for future events.

For the first time, all athletes and officials will be housed in a single 94ha Olympic village, which cost \$470m (Atlanta actually had eight separate villages). The village, a new suburb known as Newington, will be a showcase for green technology. Solar power will be used throughout, and the buildings will use computer-controlled intelligent air-conditioning systems that function only if someone is inside.

The environmental theme extends to transport as well. The Olympic Roads and Transport Authority (ORTA) will run fleets of buses powered by natural gas (most passenger movements, however, are scheduled to be by train).

ORTA is jointly operated by NSW's Roads and Traffic Authority (RTA) and SOCOG, and is responsible for providing vehicle, ferry and train transport systems for spectators, participants and the media. Its internal IT needs are separate from the main effort and involve existing infrastructure, tested at volume for the first time at the 1998 Royal Easter Show.

As at Nagano, traffic volumes will be monitored. Integration with SOCOG's systems means that scheduling information, adjustments to timetables and instructions to passengers can be issued electronically.

This involves a huge amount of data. At peak times, ORTA's Olympic Park railway station systems will handle 30 trains and 50,000 rail passengers an hour. Bus stations with 36 platforms will need to handle 28,000 people an hour, supplemented by ferries. There will also be special transport for the media and

Games participants, with shuttle buses running on restricted lanes between venues and relevant Sydney landmarks. These services are scheduled to continue for three days after the Games.

Talk tactics

Samsung's chairperson, Kun-Hee Lee, was elected as a member of the IOC in 1996 (his sport has always been wrestling). He has been involved with South Korea's Olympic efforts since 1984 and he even has a personal Web site about his IOC membership at <http://www.samsung.com/ioc/sindex.html>. It follows that Samsung has something to do with the technology being used for Sydney 2000.

The company is responsible for providing wireless telecommunications, a role it inherited from Motorola following the Atlanta Games. Telstra provides the physical infrastructure, but it is Samsung that is providing mobile phones, pagers and other radio communication devices. At the Nagano Winter Games, Samsung provided over 14,000 individual units for athletes, officials, volunteers and the media. Samsung's Sydney team was dispatched to Nagano and told to gain as much experience as possible.

Having a single mobile phone supplier should eliminate network compatibility issues for busy officials and dignitaries, but overseas spectators will have to keep an eye on Australia's mobile phone situation. By September 2000, the first CDMA networks should be in place (particularly in a city like Sydney), but GSM will still dominate. This may cause a few problems for visitors who bring mobile phones with them, but for others, such as Americans with dual-mode handsets, roaming should be easy and transparent.

Telstra, meanwhile, is the Games'

newest technology sponsor. It is the major Australian company involved in Games IT sponsorship, taking over from equivalent local telecommunications carriers NTT in Japan and AT&T in the US. As early as October 1996, it began installing over 48km of conduit, building hundreds of lockable manholes, and connecting its cable to buildings at the Homebush Olympic site.

Providing the Games' physical telecommunications infrastructure for voice, data and video, Telstra has dubbed its contribution 'The Millennium Network'. This includes the provision of phone and fax services, the capacity to carry HDTV signals for the media, and connectivity for SOCOG's information technology. The network will be based on fibre-optic Synchronous Digital Hierarchy (SDH) technology and a self-healing ring topology. Telstra will also use its global communications capabilities, such as its Intelsat access, to serve overseas broadcasters.

Emergency services will have their own communications equipment in place, with operations centres in all major Olympic precincts.

On your mark

In 2000, as the world watches sprint finals, gruelling marathons and other feats of speed and endurance, other eyes will be on machines. It sounds corny to compare years of training the human body with years spent preparing information networks to fulfil a complementary need, but why not? In each area, there will probably be immense satisfaction for a few, and terrible disasters for others.

It's all about performance on the day, and, presuming most things go according to plan, you're sure to hear something of the results.

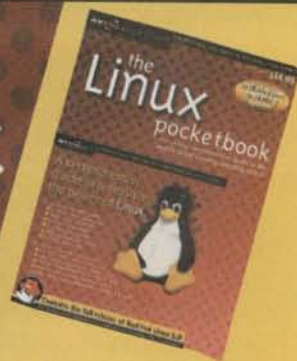
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Information unlimited

There are two departments within SOCOG that are creating Web pages. One will have about 90,000 potential users, while the other is expected to generate 3 billion hits from tens of millions of readers around the world. Yet the first is much better staffed.

Why? Because those 90,000 users are the athletes, officials, committee members, volunteers and media representatives — the groups who need to know the information *first, on time and reliably*. The system they will use is Info2000, an intranet available through terminals distributed between media facilities, all 39 event locations, the Olympic and media villages and some hotels.

Most of the public will never encounter it, but you'll know Info2000 and the Commentator Information System are working when you hear an introduction like 'Here's the six-foot-two competitor from Peru, who likes to eat porridge for breakfast and hopes to learn to surf while she's in Sydney'.

If you hear that the Peruvian is seventeen-foot-four and likes to eat surfboards for breakfast, you'll know that just as in Atlanta, something about Info2000 has gone terribly wrong. For Nagano, Info98 took a successful, simpler approach using Lotus Domino, but it contained such vast amounts of information that some users got lost in it (occasionally by design). Info2000 will be even more complex, but potentially look simpler still.

"It's not going to be pretty," said SOCOG's manager for Results/Info2000, Stephen Dettre. "It's not going to have lots of graphics and sexy designs on it. It's a working tool... [It] will be lean, cut-down — basically just pushing out information. And the reason for that is we want it to do it as quickly as possible. I don't want to whack on huge colour photos if you don't need them."

"Info96 was touchscreen and it stepped down... you couldn't skip steps, you had to always go to the next step. Info98 was mouse-based, Web browser technology and with all the inherent hyperlink systems that can be brought into that. It gave you a great spiderweb... you could go wherever you wanted to."

Designed with the shortest possible learning curve in mind (15 seconds), Info's current format involves three distinct subsystems: an email system, a data entry system and an information retrieval system. In Nagano, fan email proved extremely popular. Some of the most regular visitors



SOCOG's manager for Results/Info2000, Stephen Dettre, will produce a lean, information-centric service.

to the terminals were the Jamaican bobsled team, whose worldwide cult following (and huge Japanese fan base) generated a huge number of messages. All email users will require a password which can be used at any terminal.

The data entry system is for use by SOCOG's Info staff. The bulk of Info's content will be generated by its Olympic News Service (ONS), operating with about 1,000 staff along the lines of a news agency like Reuters. ONS reporters will bring back event news and press conference quotes and write internal SOCOG news, and 'biography flying squads' will keep athlete information current. Weather, transport, security and other reports will be compiled by teams of professional journalists, media students and volunteers.

One Sydney newspaper journalist told APC that the Olympics is already regarded as one of the busiest 'rounds' for a reporter. So much is already happening, whether connected with stadium construction or SOCOG Board machinations, that the sheer volume of Olympic news by September 2000 will be staggering. By the time it was taken offline, Nagano's Info98 had handled 6,532,018 transactions.

Even so, not everyone likes to read from a screen — there's a low-tech approach, but even that may not escape 'improvement'.

"Everyone always overlooks good old-fashioned pigeonholes," said Dettre. "Well, they're not going to be digitally

operated, but we're looking at the whole method of getting that information out. There's not much point doing all this work, producing all this information, and then putting pieces of paper in what I call 'paper coffins', or old-fashioned pigeonholes... We're a bit like the supermarket — we're providing all these goodies and we want people to go and pick from them... And I think we've got some ideas about some unique information displays."

Across all the Olympic IT systems, intel-

lectual property remains with the organising committee — technology is just the conduit for what it creates. SOCOG's Web site, <http://www.sydneyp.olympic.org/>, shares much of Info's content, but will be a little glitzier than its purely functional sibling. Don't expect heavy graphics, though, because Syd-

ney's site is expected to smash all previous Web access records.

After being taken by surprise in Atlanta (187 million hits and some downtime), IBM ensured the Olympic Web site in Nagano survived 640 million hits over 16 days. During the women's figure skating final and the Russia versus Finland ice hockey semifinal, traffic from Europe and the US took the hit rate to 110,414 per minute, higher than any previously recorded Web site access.

Based on these precedents, 1 billion hits for Sydney is a conservative prediction. SOCOG's Web manager, Mark Jackson, is expecting about 3 billion. On the ground, there are only 8.5 million available tickets, so those left out will want all the inside info they can find. As in Nagano, athletes will be able to create their own Olympic home pages using a facility in the Olympic village, meaning the Web will offer more depth than traditional media.

It all just has to be ready on time. Both the Info and Web teams are well into their jobs, preparing for test events and gradually bringing more people on board. The ONS database should be active early this year, and September 1999 will bring nine test events in quick succession, testing all applications together.

"There are four things," said Dettre, "there's birth, death, taxes and the fact that the flame will be lit on September 15 in the year 2000. So if we're ready or not, it's going to get lit."

Simon Vandore

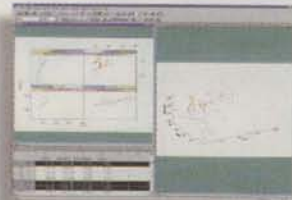
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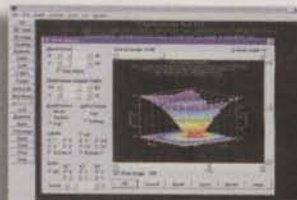
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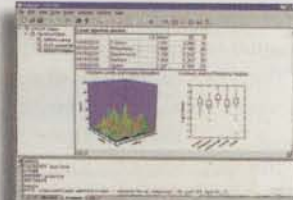
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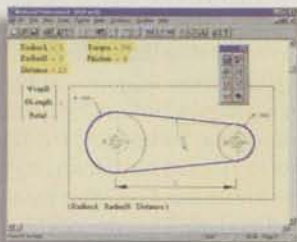
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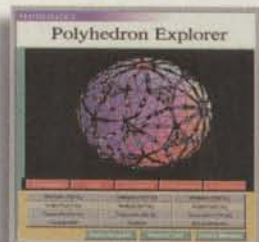
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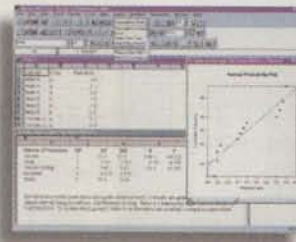
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Microsoft is betting the farm on Windows 2000, so it needs to be good. We take a peek under the hood. **By Nathan Taylor**

Windows 2000: Does it deliver?

It's clearly going to be the most important computer product released this year — or next year, depending on whether Microsoft can meet its deadlines. Windows 2000, formerly known as NT 5.0, is the product that will unify the Windows 9x and NT product lines. Microsoft has to get this one right.

Windows 2000 is designed to bring together the user friendliness, product support and API support of Windows 98 with the greater stability and manageability of Windows NT. Windows NT 4.0 was a GUI upgrade. Windows 2000 is an overhaul of the operating system.

It's currently in Beta 3, although we only had a chance to look at the product at Beta 2 stage. The release version of the product is scheduled to be available late this year, although given Microsoft's history of missing deadlines, a number of industry analysts have cast doubt on this date, expecting an early 2000 release.

As with previous versions of NT, Windows 2000 is actually two products — Workstation and Server. For this review, we've focused primarily on the Server product, because this is where most of the developments are happening, but the impact of the new Workstation product is not to be overlooked, especially in the consumer space.

The state of the beta

In spite of the advertised "feature-complete" nature of Beta 2, it is obvious the development process for the product still has quite a way to go. Many areas — especially Active Directory — are still fairly rough, and a lot of work needs to be done to get these areas up to scratch. Do we think the product can be released on time (late this year)? Yes, although it's always difficult to tell how long it is going to take to fully debug a product.

The stability of the product will also need to be worked on. We know it's a beta, but developers working on products for it now will most likely be frustrated by the number of crashes and surprise slow-downs. More important than anything else — even Active Directory — Microsoft has to get this aspect of the product right.



Windows NT 4.0 is growing fast, but has come under a great deal of justifiable criticism about its lack of stability. If you can get an average of 30 days' continuous uptime out of NT 4.0, then you're doing well. Meanwhile, in the Unix world, people talk about uptime in months, even years, rather than days. For this reason, Unix still has a stronghold in many mission-critical operations. If Microsoft is to break this stronghold, then Windows 2000 will have to be more reliable than previous Windows releases.

The Gartner Group is actually recommending that companies wait until at least the first service pack has been released — expected to be six to nine months after the release of the product. Earlier this year Bob Hayward, group vice-president of Gartner Research, told **NewsWire** that he doesn't expect serious adoption of the operating system until 2001 or 2002.

Windows 2000 in the home

One area in which 2000 might achieve some early adoption is, in fact, the home. Although officially a business operating system (at least until a consumer version is released sometime after the initial launch), Windows 2000 has many features to please home users who want to install NT.

Windows NT 4.0 lacks a number of key consumer features, notably USB, Plug and

Play (PnP) and DirectX support. Without these, it is incompatible with many consumer devices and programs, including most games. A shame, given its improved stability and features over Windows 95/98.

Additionally, on Pentium II processors, with 32-bit code optimisation, all versions of Windows NT run faster than Windows 95/98. On the latter, a Pentium II won't run much faster than a similarly clocked Pentium processor because of large chunks of legacy 16-bit code. Windows NT, however, will benefit by as much as 50% from the now ubiquitous Pentium II processor.

There is already support in Windows 2000 for ACPI, USB, DVD, AGP, PnP and DirectX, although the DirectX implementation has a way to go (it was not functional in Beta 2, but was planned for Beta 3; the same goes for OpenGL). USB and AGP, however, work as well as, if not better than, Windows 98. The DVD support was excellent. A Cinemaster Card and DVD drive were automatically detected, and we couldn't even get the PnP configuration to die. Very well done.

Given these new capabilities, moving Windows 2000 to mobile computers should be a doddle. And specifically for mobile computers, the new OS also features something Microsoft has borrowed from Notes and the PalmPilot; the Synchronisation Manager. Using a simple set of options, this replicates and synchronises network files and folders that a user wants

to take with them. Obviously, this could be done manually, but the Synchronisation Manager is definitely a nice touch.

Installation

The install procedure for the system initially looks like NT 4.0, but after the first stages, develops into a more polished 95/98-style install. It's easy and streamlined, but almost unbearably slow in Beta 2 — it took a number of hours just to get a basic system up and running. It requires fewer reboots than NT 4.0, but two or three are still needed. At least the initial network configuration has been much improved (as anybody who has installed it from a NetWare file server will testify). Fortunately for OEMs and large corporations, the installation can be scripted.

Beta 2 had fairly wide driver support, although the driver model still needs some work. For video at least, neither NT 4.0 nor Windows 98 drivers would work under Windows 2000, forcing us to spend a great deal of time in VGA mode. Not fun.

At the moment, Microsoft is listing the minimum specification for this machine as 166MHz Pentium with 32M for Workstation, 64M for Server — although that's

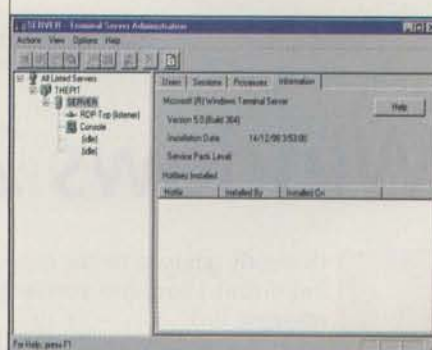
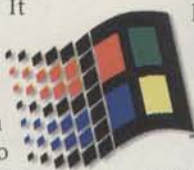
rather like saying Windows 95 runs just fine on 8M.

Usability

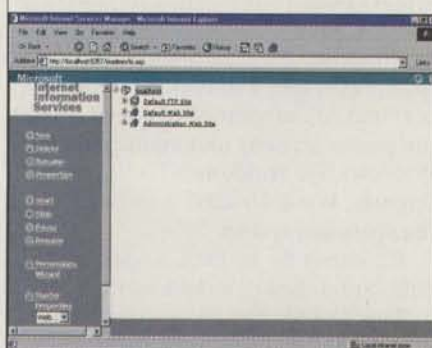
Surprisingly, Windows 2000 is even easier to use than Windows 98. Both versions of the product deliver a copious amount of new wizards and guides which take users through many of the more complex tasks, including detecting or changing hardware configuration, setting up performance parameters, and so on. The general system management interface has been cleaned up somewhat, with a friendlier feel and other nice little tweaks that take a lot of the pain out of system configuration. Clearly, Windows 2000 is leagues ahead of Unix on this score.

In a feature borrowed from Office 2000, and just as annoying here as it is there, Windows 2000 incorporates 'learning menus' — the Start menu will adjust itself depending on usage patterns. Infrequently used options will disappear from the menu, only re-appearing if you wait a few seconds or click on a chevron to expose the icons. This is not a feature for everyone, although some people will find it useful.

Another feature with wider application



The Terminal Server console



HTML-based administration for IIS

Deploying Windows 2000

Despite widespread beta availability, most Australian businesses are taking a wait-and-see approach to Windows 2000.

APC contacted 25 major Australian companies, including Pepsi-Cola Bottlers, Pfizer Pharmaceuticals, Orix Corporation, Mercedes-Benz Australia, and Queensland Lotteries in an effort to gauge the penetration of Windows 2000 consciousness. Of those contacted, only two — Mercedes-Benz Australia and Queensland Lotteries — had looked at a beta, and neither opted to put an evaluation program in place.

The reasons behind these companies' lack of enthusiasm for Windows 2000 can be broken down into three groups. A prime example of the first is NSW gaming machine manufacturer Aristocrat Leisure Industries. Aristocrat recently deployed NT 4.0 as a standard operating environment and doesn't anticipate making major upgrades — NT 4.0 service packs aside — in the near future. The second group indicated they had an intention to evaluate Windows 2000 either now or in the future,

primarily because they are committed to a Unix or legacy (mainframe-based) IT infrastructure. Pfizer Pharmaceuticals is a good example.

Those in the last group, represented by Mercedes-Benz Australia and Queensland Lotteries, intend to wait until Windows 2000 goes into commercial release before they take a good look at it. Even then, they'll probably wait until Microsoft releases the first service pack before an implementation is considered.

Windows 2000 deployment issues can be broken down into client and server-side requirements. Andrew Birch, Mercedes-Benz Australia's IT Projects manager, said that on the client side he's looking forward to the availability of Windows 95 features like Plug and Play, as well as wider prevalence of the common device driver model. "Windows 2000 looks like it'll be a great mixture of the domestic Windows 95-type features and the enterprise capabilities of NT," he said.

Server-side issues are of more importance to Vince Keller, team leader for computer support at Queensland Lotteries.

Keller said although he'd used an early Windows 2000 beta, he had put off installing Beta 2 onto the Pentium II 300 test machine for time reasons. "From my experience with [the early beta] you really need to change the way you think about security issues," he said. "When it comes to deployment, though, what we're looking for is greater ease of management for NT 4.0 workstations."

"What I'd really like is the ability to let workstation users have some degree of control over their desktops — say, installing HPC clients — but not full control over system settings," he added.

For Mercedes-Benz's Birch, the server-side benefits could be distilled into two words: Active Directory. "Active Directory will be a great boon to management, but it seems to me that you won't reap the full benefits unless you perform a business-wide upgrade to Windows 2000," he said.

Josh Gliddon

This article was compiled with the assistance of LAN Corporate IT's 'Corporate IT 500' list.

Beyond 2000: Microsoft looks to the far-off future

With Windows 2000 not expected to 'go gold' until late 1999 at the earliest, Microsoft is officially staying fairly quiet about proposed upgrades to its enterprise OS after that point. Nonetheless, the company's longstanding tradition of leaking information concerning future product plans continues, and provides some clues to the likely evolution of Windows 2000.

One of Microsoft's few firm commitments is for the planned release of the Datacenter Edition of Windows 2000, which the company describes as a "new packaging option" rather than a separate release. However, the fact that it isn't set to ship until three months after the main version of Windows 2000, and its raft of new features, including support for 16-way symmetric multiprocessing and the ability to handle 64G of physical memory, do mark it out from the rest of the 2000 family.

Microsoft is aiming the OS at the relatively specialised data warehousing and simulation applications, which mean it is likely to enjoy the smallest overall sales of any product carrying the Windows 2000 branding.

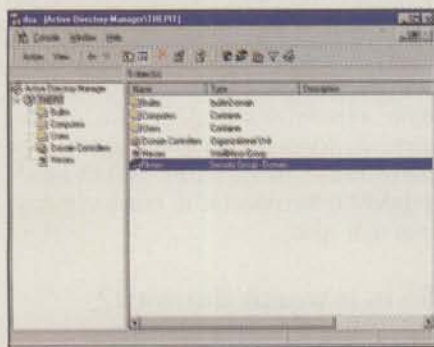
At the opposite end of the popularity scale, a second priority will be developing a version of Windows 2000 for the mass consumer market. Microsoft has made no secret of its plans to merge all its Windows products (with the exception of CE) around the 2000 kernel. Early reports suggest that the consumer edition, which has been variously named as Windows 2000 Personal Edition and Windows 2000 Home Edition, will include automated home networking wizards and basic voice recognition (one of the company's most-hyped general goals).

In the enterprise market, Microsoft's key challenge will be to develop a 64-bit

version of 2000 (some features such as support for large amounts of memory rely on 64-bit instructions, but most of the initial release of 2000 remains 32-bit). In this area, Microsoft is lagging behind most of the key enterprise Unix flavours, although officials have said that a 64-bit version will be available once Intel's own IA-64 processors, expected some time in 2000, are released.

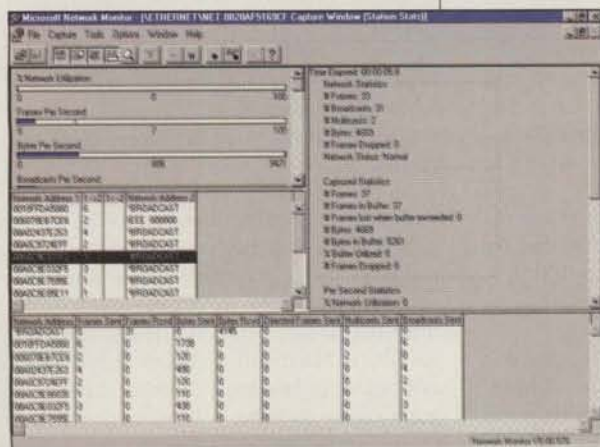
In the end, the timing of the plans may not matter too much. Analyst Ed Tittel of US consulting firm LANWrights points out that in the enterprise market, rushing to upgrade an operating system is the exception rather than the norm. "Most major companies take a wait-and-see attitude. It's usually 12 to 24 months and a couple of dot releases before they'll consider a new product," he said.

Angus Kidman



Active Directory in action

The Network Monitor



is the integration of Index Server in both the Workstation and Server products. These allow local drives to be full-text indexed, and word searches to be performed on those files with the Find function in the Start bar. A very cool feature, and well implemented, the Indexing Server can be applied to any drives to which the computer is connected, and indexing targets can be precisely specified if necessary.

Administration

Most of the administration tasks in Windows 2000 are achieved with the Microsoft Management Console (MMC), and architecture based around 'snap-ins' provided by Microsoft and third-party vendors. You start with an empty console, and apply these snap-ins to create a Windows

Explorer-like administration console. You can have more than one snap-in on the console at the same time, and can save the console configuration for later. Windows 2000 also comes with a number of consoles already preconfigured for you, but the ability to create and customise your own is a nice touch.

On the downside, the console framework is not always the best for administering certain tasks. Active Directory, for instance (see below),

might have benefited from a more flexible framework à la NDS. That aside, the MMC is not a bad way to manage things.

However, not everything is managed via MMC. Internet services (which are pretty much the same as in NT 4.0, running the latest version of IIS), for instance, are managed via their own consoles. They also have an HTML administration feature, where the servers can be managed via a Web browser. Very handy — it's a shame that more of the administration consoles don't have something similar.

In many areas, Microsoft has done a truly bang-up job of client administration. A number of the snap-ins can be configured to manage a client machine just as easily as the server itself. When targeted at a client system, the snap-in can manage the client seamlessly.

As an added bonus, the Windows Scripting Host (WSH), once part of an option pack for NT 4.0, is now integrated into the core OS. The WSH allows COM objects to be utilised via simple scripts — similar to the way a number of scripting languages like Perl work under Unix and NetWare. The scripting host is a useful tool, and can undertake automated application installation for administrators and OEMs.

Active Directory

For the past few years, when trying to prove NetWare's superiority over NT, Novell's catchphrase has been "we've got NDS". Now Microsoft has NDS. Or its own version of it.

Active Directory has pretty much the same task as NDS (it even looks very similar), acting as an information and management repository for, well, pretty much any server-related task under Windows NT. It stores information on users, groups, printers, shared directories and other network objects.

Active Directory actually uses two open standards at its core: the Domain Name Service (DNS) and the Lightweight Directory Access Protocol (LDAP). DNS, which replaces WINS, is used to locate and define the boundaries of an Active Directory domain. LDAP is used as the protocol for actually accessing the directory — allowing pretty much any LDAP-compliant application to find objects stored in the directory.

From the Active Directory manager, new organisational units and groups (security or distribution) can be created and populated with users, group policies can be defined, IntelliMirrors set up, shared printers and files configured for security, client machines managed, and so on. It's great to have a centralised management console like this, and an object-oriented one at that, but Active Directory is not a panacea.

First of all, the integration of the Active Directory with what could only be described as the 'legacy' features of Windows NT 4.0 could hardly be called seamless. There are also numerous rough edges that will need to be smoothed before the product is released — it's hardly a 'drag-and-drop' enterprise at this stage.

Still, Microsoft is off to a good start. We quickly set up a number of users, put them in an organisational unit, defined group policies and assigned directories and printers. Not too shabby, although obviously something of a feature copy of NDS.

Additionally, Active Directory can replicate between domain controllers in a single domain, alleviating the need for Backup Domain Controller.

User management and the Terminal Server

A product of the Zero Administration for Windows (ZAW) initiative, the user manager can be configured to restrict access to certain features of the operating system — such as the Start bar, Control Panel, or all but a few selected applications — by users or groups of users. Like many of the features of Windows NT 5.0, group and user policy management can be handled for all workstations from a central server, enforcing policies across the network and saving

the administrator from manually attending every workstation.

User management is a bit complex. The 'Windows Explorer' schema used in the MMC is perhaps not the most appropriate means to achieving this end.

Terminal Server has been fully integrated into Windows 2000 and, unlike Windows Terminal Server, works well with the user management features of the system. Terminal Server, for those unfamiliar with the product, lets clients just see the visible results of applications run on a server, rather than doing the full processing at the client. This is designed to enable thin and highly managed clients.

Unfortunately, Microsoft has yet to expand its client range, an area where Citrix still has an advantage with ICA. MetaFrame also happens to be a bit easier to use and configure, but this could be overcome by the time Windows 2000 ships. MetaFrame, which runs on top of Terminal Server, will benefit from the wider availability of the platform, but will also suffer as it has less to offer over and above the basic Terminal Server package.

Another feature borrowed from ZAW is Roaming Profiles. This stores a user's desktop, Start menu and My Documents folders on the servers, and transfers them back to the desktop when a user logs into a workstation. Required applications can also be configured to install on demand when a user logs in. This could be handy for companies with a lot of mobility between devices, although the poor integration between the user manager and Active Directory we mentioned earlier makes the process a bit painful.

Enterprise features

Scalability and security were key design goals of Windows 2000, and Microsoft has succeeded, on paper at least.

Although we installed both Server and Workstation on a single-processor system, Windows 2000 will support up to eight processors (more in OEM versions), and incorporate Transaction Server, which can manage processor/task allotments.

Beta 3 should also see the debut of the clustering features Microsoft acquired when it bought Valence Research. This is more than just the failover provided by NT 4.0 Enterprise Edition and should provide load-balancing capabilities to Windows clustering.

Another new feature is the support for Enterprise Memory Architecture (EMA), which basically expands the addressable memory space to 64-bit rather than 32-bit,

if the hardware supports it. Servers with massive amounts of memory will benefit from this technology.

Windows 2000 also adds a feature called the Encrypted File System (EFS), which lets users designate files and folders to be encrypted and accessible only by users with the proper private key. This has been possible using third-party products for some time, but now it is integrated into the operating system. It's unclear how much the files will be encrypted, although given current US laws prohibiting the export of encryption using keys larger than 56-bit, it is unlikely to provide better protection than many of the more heavy-duty third-party products. Additionally, the new version of NTFS, 5.0, allows you to find files by the user or owner.

For authentication purposes, Windows 2000 uses Kerberos, a key distribution system already in use on Unix machines for client authentication. Rather than having clients with local keys, the server distributes temporary keys on an as-needed basis. As a bonus, Unix clients (running Kerberos) can better access NT servers.

Although we were unable to test this, Windows 2000 also incorporates support for Hierarchical Storage Management (HSM) — a system whereby little-used files are dynamically off-loaded to slower but more expansive storage media, such as tape. A development coming from the mainframe world, this is obviously required if Microsoft is to move Windows into that space.

So is it worth the wait?

Windows 2000 promises a lot. It promises to take away a lot of the annoying features and restrictions on Workstation. At the server end, it promises to be a product with the management and file and print services of NetWare, plus the security and scalability of Unix. It's meant to be a best-of-breed solution. And it can be, if Microsoft can get it right.

Judging from Beta 2, there is a huge amount of promise in Windows 2000, but many of the rough edges must be smoothed before it will be superior to its competitors. All the features in the world will be useless if the product continually crashes. Active Directory, while good, still lags behind NDS in many ways — its administration architecture is still a bit rough. If Microsoft can sort these issues out before its release, however, then we're truly going to have a landmark product on our hands. ■

Completely uninstalling a program isn't always as easy as it could or should be. **By Darren Ellis**

Clean it up

A good Windows uninstaller program can mean the difference between having a neat, uncluttered hard drive and premature hair loss. Why? Because if you've ever tried to remove a program in Windows and failed, it was probably due to the rather inefficient way Windows handles this sort of thing.

Prior to the appearance of Windows 95, the most complex program uninstallation involved deleting the program manually, removing changes to the CONFIG.SYS and AUTOEXEC.BAT, and maybe hunting down a few partially hidden files afterwards. Now programs reach deep into the system registry, menus and INI files.

But when an uninstallation doesn't work, it is not always Windows that is to blame. Many software companies are lackadaisical in writing decent uninstall routines for their programs. This means that although Add/Remove Programs works well at times, quite often it's an individual software vendor's fault when it doesn't.

When a program is installed, the main action is the copying of files to the PC's hard drive. Normally these are written within the program's directory, but some installations require files like DLLs to be copied to other directories. Often when uninstalling, these files are forgotten, and after a while these 'orphan' files can add up. Temporary files and directories are also commonly left behind. A look at the Windows/Temp folder when no other programs are running quite often reveals a surprising amount of wasted hard disk space.

A big change in the jump from Windows 3.x to Windows 95 was in the registry — a hierarchical database where program, hardware, and plug-and-play and user settings are stored. The registry's main purpose is to eliminate the need for many system files.



Unfortunately, the registry can also fill up with nasty bits and pieces that conventional uninstall routines forget to delete. The more crud that accrues in the registry, the longer it takes to process on startup, and there's a corresponding increase in the likelihood of a corruption. Once the registry is corrupted, you can say goodbye to Windows. A good uninstaller can dig through the registry and display the leftover keys and values, and then let you decide which ones to delete. You should only do this if you know what you are doing.

Backing up is important because even uninstallers can get it wrong (an observation based on bitter personal experience.) Legacy programs that don't use the registry rely on fiddling with the system files — CONFIG.SYS, AUTOEXEC.BAT and the occasional INI tweak. The uninstallers we tested dig into these files and display the settings for the user, which is useful

because the changes can rarely be undone when using a program's uninstall routine.

Other niggles associated with the uninstallation of programs include them forever remaining listed in the 'Add/Remove Programs' dialog box. Windows 98 deals with this by asking if you want to permanently remove the entry, but for 95 users they'll remain. Some shareware programs help clean this box up for good, and they are listed on page 78.

For the purpose of this feature, we devised our own tests for seven shareware and commercially available uninstaller programs

(see 'How we tested', page 77) to see how much better they fare than the options included in the different versions of Windows (see 'Do You Need an Uninstaller?', page 75).

Two significant products in this market have been Symantec's Norton Uninstaller Deluxe and Quarterdeck's CleanSweep. When Symantec bought Quarterdeck late last year, it was decided to merge these two applications, although at the time of writing the standalone version of this new program — Norton CleanSweep — was not available for us to test. You can expect to pay about \$79 for the program when it eventually hits the shelves. Thus, these reviews feature Quarterdeck CleanSweep, but not Symantec Uninstaller Deluxe, which is no longer available because of legal issues with McAfee over the code used in McAfee's Uninstaller and the Norton product.

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and other debris that we left on the test system, but did not appear to remove anything vital to the system's operation. It effectively removed an old application and the left-over drivers for a hardware device, but was much less effective at removing the network drivers. The fact that it completely ignored Netscape's cache was not impressive.

Josh Mehlman

■ Distributor	IMSI
■ Phone	(02) 9319 7533
■ Online	http://www.imsi.com.au/
■ Price	\$99.95
■ In short	Effective and safe, but not particularly impressive.

EasyClean 32

BERND KLAIBER

EasyClean 32 is a small, but powerful, shareware uninstaller program. It is a very capable uninstaller, although it lacks some of the features and add-ons found in the better uninstaller programs, such as the ability to check for orphan files or other miscellaneous junk on a drive.

What it does do is monitor all modifications to the registry and system files, and logs each file change on the drive. The registry changes can be undone with EasyClean 32, but it still leaves the physical files behind to be removed manually. It displays the changes in an easy-to-view manner.

Another niggle is the interface, which



indicates that this uninstaller was designed for users who have a good idea of what they are doing. It lacks the user friendliness of McAfee's UnInstaller or Quarterdeck's CleanSweep with its two tiers of tabs — a bit confusing and annoying if you're going to use it frequently. And you will, because the program has to be run manually before and after each installation, as it lacks the ability to monitor quietly from the background.

In our tests, it failed to remove any of the 16-bit Netscape program and it also left most hardware drivers behind, uninstalling only 35%. On the flipside, however, it was very competent in removing almost 94% of the network drivers. In the end, it was the program that left the most files behind on the drive — but this is because it backed up the system files. Basically, EasyClean 32 is small, capable and digs right into your machine, but it lacks the full functionality that would have made it a winner against the commercial programs.

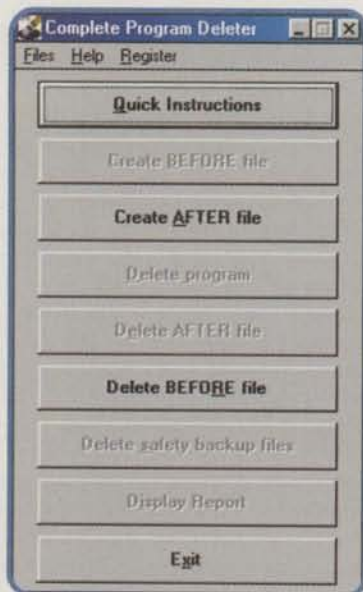
Darren Ellis

■ Distributor	Bernd Klaiber
■ Online	http://www.idv.de/homepages/bernd/
■ Price	Posted cash, \$US40. Credit card payment, \$US45.
■ In short	Great program, confusing interface, but worth it for the power user.

Complete Program Deleter

LEITHAUSER RESEARCH

Although it looks rather primitive — almost like Windows 3.1 — Complete Program Deleter is an effective uninstaller for most programs. It doesn't provide an awful lot of options, just a series of buttons that let you create 'before' and 'after' snapshots of your hard disk, and one to restore your system to the 'before' status by deleting all the extra files. Of course, this doesn't help if the program installation has written over some of your system files, as frequently occurs. Complete Program Deleter would be most effective on systems running Windows 3.1. It doesn't notice, let



HIGHLY COMMENDED

● Quarterdeck CleanSweep

BEST SHAREWARE

● EasyClean 32

After vigorous debate, we decided that none of the uninstallers we tested merited an Editor's Choice award. Only one uninstaller, Symantec's Quarterdeck CleanSweep, removed the majority of the unwanted files from our test system. However, it was perhaps a little too aggressive, to the point where it could potentially remove important files without which some applications may not work. Users would be well advised to leave the Safety Sweep feature on — it prevents you from removing anything too vital. Despite this, we found CleanSweep to be the most functional and powerful uninstaller in this review. The interface is well designed, and the program does everything its competitors do, and then some.

EasyClean 32 is the only shareware uninstaller in this review that takes into account the changes made to the registry and system files. Although we had niggles about the interface and the way it works, it's certainly the most powerful shareware option in this review.

alone restore, changes programs make to your system registry.

On the other hand, this low-tech approach can also be very useful. Taking 'before' and 'after' shots is the only truly effective way to remove files left over from hardware and driver installations. Even the more advanced uninstallers were not as effective as Complete Program Deleter in removing the hardware and network drivers from our test system.

The Deleter is very effective at saving space, but it doesn't clean out your registry or system files, so you may find your system is still slow.

Josh Mehlman

■ Distributor	Leithauser Research
■ Online	http://members.aol.com/Leithauser/
■ Price	\$US25
■ In short	A little primitive, and better options are available unless you're using Windows 3.1.

Uninstaller

McAfee

Its interface has similarities to WinDelete Deluxe, but McAfee's UnInstaller is a lot easier to use and understand. Almost all the options can be accessed from the colourful main screen. Wizards and progress charts show you all you need to know.

The QuickClean option is just a little more thorough than the Windows 98 Disk Cleanup option. There's also a series of application options — applications can be removed, archived, moved to another folder or drive, transported to another PC, or restored from archive. The Spacemaker option lets you specify how much space you want to clear, and then clears it for you, allowing you to specify what sort of files can be removed in order to make that space.

If this isn't enough for you, there is the Power Clean menu, which allows advanced users to clean out their system more thoroughly. It doesn't find orphan DLLs, but the Power Clean menu does find duplicate DLLs.

UnInstaller has the best range of Internet



browser cleaning options of any program in this review. It cleans caches, cookies and downloaded files from both Netscape Navigator and Internet Explorer, as well as IE ActiveX plug-ins and Netscape plug-ins. It couldn't find the cache for the 16-bit version of Netscape on our test system, though.

UnInstaller has an installation monitor, which keeps track of any programs installed, by monitoring installation programs such as INSTALL.EXE or SETUP.EXE. So if you install something at a system level, the monitor will not even notice.

In terms of pure numbers, UnInstaller cleared out slightly less hard disk space

than using the standard Windows uninstallation and clean-up procedures. The data files it saves to monitor itself take up some space. But, the thoroughness with which it cleans the Start menu, registry and other parts of the system would improve the efficiency and speed of any PC.

Josh Mehlman

Distributor

Network Associates

Phone

(02) 9437 5866

Online

http://www.McAfee.com/

Price

\$69.95

In short

Easy to use, but not the most aggressive at clearing space.

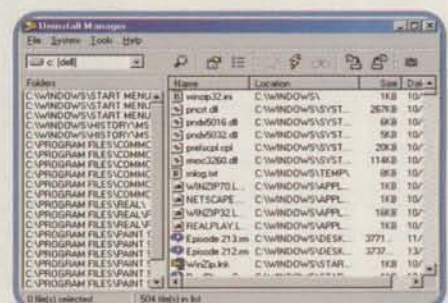
Uninstall Manager

NOKTA SOFTWARE

Uninstall Manager is one of the better shareware programs in this review, but it comes nowhere near the results achieved by the commercial packages. It has an average uninstall routine, but it makes up for this with the powerful disk cleaner functions that mark the better programs, such as searching and removing orphan files and general mess.

One of Uninstall Manager's first tasks when installed is to take a snapshot of the drive and back up the system files. It uses the snapshot to compare with other system and file changes that have been made since the program was last run. The program's default settings mean that it does this every time you start it up; fortunately, this option can be disabled from the Options menu.

Uninstall Manager does more than log drive changes; it also monitors whether the Windows system files have been modified or overwritten — including DLLs, VxDs, DRV's, EXEs and others. It won't let you restore these files, but at least it gives you an idea of how entrenched a program is. One of the handiest features is that it will keep track of orphan files and directories left behind once you've used a program's uninstall routine. It is then a simple matter of loading up Uninstall Manager and seeing what is left behind.



How we tested

The uninstaller programs were tested using a Dell Dimension XPS-450 PC with a 450MHz Intel Pentium II processor, 128M of RAM and a 10.1G IBM hard disk drive, running Windows 98. The hard disk drive was split into two partitions, one for the system, and the other for files.

We prepared the system to simulate the conditions an uninstaller would have to deal with. This included:

- Installing Lotus SmartSuite 97 and deleting the program files to leave behind broken shortcuts, orphan DLLs and redundant registry entries. The orphan DLLs took up 6.9M of disk space;
- Installing a 16-bit version of Netscape Navigator and using it to build up its cache. The Netscape program files took up 11.7M of disk space, and Netscape's cache took up 7.5M;
- Setting Windows' virtual memory swap file to a constant size.

Once this was done, we made a compressed image of the entire partition which could be restored for each program.

Each uninstaller was then put through the following tests, where applicable:

- The clean-up facility was run to see how well it dealt with broken shortcuts, orphan DLLs and redundant registry entries;
- The uninstall facility was used to

remove the pre-existing copy of Netscape Navigator;

- Hardware device drivers were installed and then the uninstaller was used to remove the files after the hardware device had been uninstalled;
- Drivers for a NetWare 3.0 networking client were installed and the uninstaller was run to remove the files after the client had been removed.

After each step, the free disk space was measured to see how much the uninstaller had removed. (We used 1,024K to a megabyte to measure free disk space.) This figure varied between uninstallers, partly because some were more thorough than others, and partly because the uninstallers all save data files and these can sometimes take up considerable amounts of space. Since we were trying to judge the overall space saved by using the uninstaller, the space used by these data files must be taken into account.

As well as judging the uninstallers on their space-saving capacity, we also considered how effectively they cleaned the registry and other system files, and whether the clean-up facility could remove files that were still needed for the running of the system.

More handy programs

Although not uninstaller programs as such, we have included here a list of other utilities and programs that have something to do with either uninstalling or cleaning up systems when they become too messy.

For example, there's RegClean, a tiny program Microsoft wrote and distributes for free. RegClean is a simple utility that scans your registry and removes any values that have become null and void. Look for this at <http://www.microsoft.com/>.

Add/Remove Pro is another small utility that tries to outdo the Add/Remove Programs applet in Windows 9x. It compares registry values against actual files, and will attempt to uninstall a program if it is found, or removes the

entry from the list if it isn't. You'll find it at <http://www.superwin.com/freeware.htm>.

Similarly there's Add/Remove 4Good which does the same thing, but has a better interface and seems to be more competent about it. Try this at <http://www.4developers.com/util.htm>.

And if you've ever installed a version of DirectX that didn't work, and subsequently tried to restore your previous settings, then you'll know the frustration it involves. A product called DirectX Uninstaller takes away some of the pain by allowing you to uninstall to the previous version and then reinstall if you wish. Go to <http://home.att.net/~ebrink1/Direct.htm> for this one.

Darren Ellis

Compared with the other programs, Uninstall Manager scored quite impressively. It was a shining star when it came to removing the network drivers — eliminating 99.1% of them when McAfee Uninstaller and WinDelete Deluxe wouldn't even touch them. What Uninstall Manager can't do is trawl your system for junk that was lurking there before its initial drive snapshot; therefore it did not remove any of the test files we had placed on it.

Darren Ellis

■ Distributor	Nokta Software
■ Online	http://members.tripod.com/~umpage/
■ Price	\$US12.95
■ In short	One of the better shareware programs; good functions and capable results.

CleanSweep

QUARTERDECK

We weren't able to obtain a copy of the Norton CleanSweep program due shortly from Symantec for the purpose of this review. But we did test the existing Quarterdeck CleanSweep product, which in the past has proven itself to be one of the best uninstaller programs around.

This certainly is a feature-packed program. The interface is pleasant and the whole program including the modules is wizard-driven. CleanSweep not only uninstalls programs, it also performs backups, archives and moves safely. When moving a program from one drive to another, or into a different folder, it makes changes to the relevant values in the registry so that it works from the new location.

The Smart Sweep module keeps track of changes made to the drive, as well as log-

ging modifications to the system files. When you uninstall a program, it will undo all of those modifications. Smart Sweep also sweeps the drive for duplicate, redundant and orphan files. We found the different safety settings extremely valuable. The Safety Sweep function acts as a guard for the files on your system by giving each file its own rating based on its importance. This protects you from deleting files that you shouldn't. However, it sometimes protects files that don't deserve it, which can be annoying. Safety Sweep can be disabled, but this is not really a good idea.

Where CleanSweep came undone in our tests was assuming that the DirectX EXEs and DLLs were orphans and deleting them. Aside from that, CleanSweep also performed the best of those tested, removing the most files overall, including an amazing 88% of the junk files on our drive. It can also remove DOS and 16-bit programs and it was able to delete almost all of Netscape.

Darren Ellis

■ Distributor	Symantec
■ Phone	(02) 9850 1000
■ Online	http://www.symantec.com.au/
■ Price	\$69
■ In short	The best uninstaller and file manager out of the bunch.



Program	Hard disk space taken up by uninstaller (M)	Orphan DLLs cleaned up (M)	Percentage of 16-bit Netscape removed	Percentage of hardware drivers removed	Percentage of network drivers removed	Percentage of unwanted files removed	Unwanted files left over (M)
RemoveR	2.0	Not capable	Not capable	96.7%	97.7%	Not capable	26.7
IMSI WinDelete Deluxe	6.9	4.7	94.9%	93.2%	-0.5%	32.6%	11.5
EasyClean 32	0.7	Not capable	Not capable	35.5%	93.9%	Not capable	31.0
Leithauser Complete Program Deleter	1.6	Not capable	Not capable	100.0%	97.3%	Not capable	26.6
McAfee Uninstaller	9.2	0.1	90.2%	90.5%	0.0%	0.4%	17.3
Nokta Software Uninstall Manager	0.6	Not capable	Not capable	66.3%	99.1%	Not capable	28.9
Quarterdeck CleanSweep	15.7	12.7	94.6%	96.5%	16.4%	88.5%	3.7

Devices that combine multiple office functions are becoming increasingly slick. By Jeremy Torr

One in, all in

Many people concentrate all their efforts on buying a computer, and only think about add-ons like printers, modems and scanners when the PC is up and running. New computer owners often delay buying these essential extras, not just because they are expensive, but also because their complexity can be a little daunting.

Unless, of course, you buy an all-in-one or multifunction device (MFD). Although all-in-ones have been around for a few years now, their uptake hasn't been as high as their originators, such as Brother and Hewlett-Packard, hoped. Until recently, consumers seem to have been a bit suspicious of putting all their eggs into one input/output basket. The perception seems to have been that if you have an MFD and the printer goes belly up, so will the scanner, fax and copier. The increasing popularity and reliability (as well as falling prices) of printers, scanners and fax modems, however, have moderated, if not allayed, most of these fears. Today, the MFD market is the most rapidly expanding SOHO office machine category.

The actual role of MFDs vary considerably. Some will do everything the SOHO user could want, with or without a PC. Phone answering, scanning, printing, copying, reducing and enlarging, plus sophisticated fax and colour capabilities is now all there in one box. But many users may simply want to use the MFD as no more than an extension to the printer or fax machine, perhaps with a little OCR capability thrown in.

It can be argued that either way, the new buyer will often be better off buying an MFD before a PC — they get all the capability of standalone machines, plus extended facilities if they do connect a PC later. Additionally, given that a good warranty is important on this kind of machine, all makers offer at least 12 months' support, with some warranties extendable up to three years.



The other side

MFDs do have their downsides. In most instances, the scan capability is fairly slow, because it is based on page feed systems. Also, to save space most manufacturers use a medium-duty print engine rather than a high-duty and capacity mechanism. These two factors mean that most of the units we looked at are best for small-to-medium volumes of work.

Load them up with a multiperson office workload, and at best they will start to gobble consumables; at worst they will physically wilt. However, compared to the cost of all the separate peripherals and the multiple connection anguish that often accompanies them (not to be underestimated), MFDs still come up trumps for the average SOHO situation.

All of the machines we looked at are available for street prices under \$3,000, and there's a new crop of highly capable, colour-enabled pretenders coming in at about \$1,000 to \$1,500. Compare this with the cost of discrete peripherals, plus all the associated software, and an MFD looks very good.

In most cases, the other major appeal is the simplicity of the software. Most

MFDs use a central software manager which coordinates and organises all the various tasks on offer. Most units also duplicate this fairly complex arrangement on the operating panel of the unit itself, so understandable controls are essential. If the user is a SOHO operator who wants to use the MFD as a smart communication centre, the ability to add an answering machine on the same line is obviously important, but some machines don't have this capability built in. Likewise, those units that have the fax as their core will often cut corners slightly on the scanning capability, as fax resolution is much less critical than if scanning in photos for DTP or similar.

In terms of general value, it seems that the best product is now coming not from general office equipment makers, but from those that have made their mark in the computer-based input/output arena — Canon, Hewlett-Packard and Brother. This new breed now offers colour, total integration of facilities, and quality on a par with many standalone peripherals — all in a package not much bigger than a standard desktop laser.

MFC-6650MC

BROTHER

Brother is one of the longest-established MFD makers, and its experience shows. The MFC-6650MC builds the usual printing, scanning and faxing capability into one box, but adds a totally integrated answering machine and phone too. This means it is equally at home as a PC assistant, or as a standalone do-it-all office machine.

It is slightly bigger and more fax-like than most of the inkjet competition, and offers a bigger paper feed tray — 200 sheet. The toner cartridge and drum unit is easy to access from the front of the casing by lifting the hinged scan head and control panel assembly. The latter is a bit more complex-looking than some of the inkjet models, but is divided into sections to ease brainload.

Connections are provided for a printer (cable supplied), a phone, an answering machine and line in. This is in addition to the inbuilt digital answering machine and handset. The print engine is Brother's tried and tested 600 dots per inch (dpi), six pages per minute (ppm) engine, and the scanner works at about 300dpi — although the specs didn't give an exact resolution. The supplied software is comprehensive. As well as Visioneer PaperPort scanning and archiving software, Brother has thrown in its own Automatic Email Print, Multifunction Link Pro (its TWAIN and printer applet), NetCentric's FaxStorm Internet faxing software, and Xerox's TextBridge OCR.

Software setup and configuration was straightforward, and user details auto-downloaded once entered on the PC. Curiously, the majority of machine defaults required direct entry via the front panel. Once set up, the output quality from the Brother was very good, both with text and graphics, as well as greyscale copies. Scanning 400dpi mono images via the Visioneer PC interface was as good as any, let down only by the lack of colour. Faxes were likewise very crisp and accurate, and notably better than some of the cheaper units.



But the aspect that really sets the MFC-6650MC apart from the bunch is its voice capability. Set the machine to auto and it will accept 20 minutes of voice messages as well as 130 fax pages either to memory or PC. However, although the Brother is a well-designed and highly integrated SOHO unit, the price still seems a bit high for a mono-only MFD.

■ Distributor	Brother Australia
■ Phone	(02) 9887 4344
■ Online	http://www.brother.com/
■ Price	\$1,399
■ In short	Very well balanced and comprehensive design features, but the cost is a bit high, given the mono-only scanner and printer.

MFC-7160c

BROTHER

If the Brother MFC-6650MC impresses you with its overall capability, then the MFC-7160c will even more. Admittedly the laser speed is replaced with a slower inkjet, but the overall result is about as much functionality as you can cram into one box.

The MFC-7160c sits high, wide and deep, with a twin tray feed at the back, scanner input on top, and two output trays poking out in front. The scanner is a claimed 600dpi, 24-bit colour unit that is fast for a page feed scanner — a full colour A4 300dpi image took just over five minutes. Both colour and mono printing and copying are supported, thanks to the four-tank CMYK print system. The output is rated as 1,440 by 720dpi, and the results are brilliantly crisp and clean, although rather pastel and flat on plain paper compared to the results from the Canon and Hewlett-Packard offerings.

Printing is fast, taking a mere 28 seconds for a mono A4 copy, and about three minutes for a full A4 colour page. All controls are logical and obvious, with separate buttons for colour copy, mono copy, answer, fax and so on laid out around the two-line LCD.

Connections include a printer port and three RJ-12 jacks. One of these is taken up by the phone handset, and the MFC-7160c incorporates an inbuilt fax/voice answer and store capability. This can cope with up to 99 minutes of voice or 300 fax pages or a mixture of both — pretty impressive.

The bundled software, Multifunction Link Pro, FaxStorm, TWAIN, PaperPort and Automatic Email Print, all load



EDITOR'S CHOICE

● Brother MFC-7160c

Three machines stand out in this batch. The Canon MultiPass C50 is very, very good all round; it can print quality photos if need be, costs under \$1,000 and does almost everything but fax in colour. The Hewlett-Packard OfficeJet 710 is equally adept, producing the best colour output on plain paper of the machines in this review. It can fax in colour, but only copies directly in mono. Neither will blow most SOHO budgets, but both were eclipsed by the amazing Brother MFC-7160c. It can do everything, and do it fast, in colour and at impressive resolutions. If you are thinking of upgrading to a colour inkjet, look at the MFC-7160c. For not that much more, you can have a total SOHO office in a single connection box.

smoothly from the CD, but the install insisted on loading QuickTime to give a spurious introductory movie. Drivers for DOS and Windows 3.1/95/98 are all supplied. And as if all that colour, high resolution and voice capability weren't enough, the Brother can also print from a standard VHS video input.

A front-mounted RCA plug allows image capture direct from camcorder or VHS to PC, and images can then be printed. The last thing to note is that the manuals are excellent, and the ink cartridges last a generous 700 pages or so. This machine offers an awful lot of go for the dough.

■ Distributor	Brother Australia
■ Phone	(02) 9887 4344
■ Online	http://www.brother.com/
■ Price	\$1,099



In short

Almost everything you could want at a bargain price. Quality colour, copy, scan, fax, voicemail, speakerphone, video capture and more.

MultiPass C20

CANON

The MultiPass C20 is \$250 cheaper than the C50 (reviewed below), but unless you are very hard up, get the more expensive version. The C20 only has a mono scanner, has a lower scan resolution and print speeds, and produces markedly lower copy quality. The machine itself uses exactly the same format as the C50, with the same basic casing and optional phone handset. It employs the same black-only, colour or photo-colour cartridges depending on output.

Like the C50, stiff card and envelopes can be fed straight through the slot at the back, and standard A4 paper is fed through the 100-sheet upper tray. The scanner, which hides under the front-mounted control panel, is where Canon has obviously saved some of the cost over the C50. It is a 200dpi mono unit, with a 20-sheet feed capability. According to the specs, it scans with up to 64 shades of grey, but when used with anything other than direct faxes, the output seemed to be line art only — just black. And despite being mono only, it was a real crawler. An A4 image at 400dpi interpolated took just over 10 minutes and wasn't really worth the wait.

The copier function produced reasonably detailed mono copies, printing in around one and a half minutes, depending on the resolution selected from the simple front-panel controls. Reduction is also available, but large, flat-tone areas produced a fair degree of wrinkling on plain paper. Once the software is installed, the PC print and fax functions are easily accessed via the MultiPass Desktop Manager and TWAIN driver software. These are not up to the comprehensive bundle that comes with the C50, but do offer both Windows 95 and 3.x compatibility.



Printing produced good, sharp quality in colour on plain paper, and text was also very crisp with no evidence of banding at all. Faxing both from the host PC and direct was as good as any, and surprisingly produced notably better output from the receiving fax than when the same image was scanned into the PC. The included manuals are up to the usual Canon standard. In all, a good performer and good value too — if the C50 hadn't been released to upstage it so effectively.

■ Distributor	Canon
■ Phone	(02) 9805 2000
■ Online	http://www.canon.com.au/
■ Price	\$749
■ In short	Neat, competent and easy to use, but it doesn't stand out like the C50. Still, it is \$250 cheaper, which buys a lot of ink cartridges.

MultiPass C50

CANON

The Hewlett-Packard OfficeJet 710 (reviewed below) impresses with its capability and size, but it only copies in mono. The Canon MultiPass C50 is, if anything, slightly smaller, copies in colour, but it only faxes in mono. As it's virtually the same price, it's a tricky call between them.

The C50 looks a bit more like a conventional fax machine; a 100-sheet plain paper feed tray is hidden at the back and a couple of rather flimsy wire output guides are at the front. Envelopes and stiff card go through a feed slot on the back. A numeric keypad and single-line LCD, along with the basic stop/go and printer maintenance controls, adorn the front.

The machine comes with a couple of spare ink cartridges, all the connectors and cables required for printing and faxing, two hefty and useful manuals, Corel Print House software and all the usual TWAIN drivers and fax manager software. Also included is the ScanGear scanning software package and Desktop Manager suite. These are excellent, and although not quite so idiot-ready as the OfficeJet's software, offer more customisation and advanced-level tweaking to both input and output if required.

Software installation is not quite as interactive as the OfficeJet's, but the Canon offers virtually the same options. A telephone handset can be added to the unit if required, but it costs extra and removes the ability to add an external answering machine. Print output is rated at 720 by 360dpi, and the standard black

How we tested

The machines were all set up on a host Gateway G3/333 PC. We took note of how easy they were to install, and whether all necessary components were present — cables, cartridges, software and so on. Once set up, each was used to print a standard Publisher document which featured varying colours and text sizes, and embedded clip art. An additional screen grab was printed out to test each machine's tone capability.

Copies and scans were made from an A4 glossy, heavy-stock page from a magazine, featuring text, solids and photos. All procedures were timed and assessments made on the accuracy of reproduction, the sharpness and the likely media life. Faxes were sent to a remote thermal fax machine using the same A4 page image, using both direct keypad entry and scanned PC versions. Again, the output images' quality and speeds were compared. Lastly, the user-friendliness of the online help and manuals were rated, in terms of how helpful they were for the novice user trying to get the machine up and running as fast as possible.

and three-colour cartridges (only 100-page capacity) provided excellent colour output on plain paper. Using the optional photo cartridge on gloss paper would provide even better results.

Printing was not quite as fast as with the Hewlett-Packard 710, but the results were slightly smoother, although copying in mono produced noticeable banding. Colour copies and scans were very good, but not for the impatient. Nine and a half minutes to copy an A4 sheet was easily eclipsed by the 15 minutes it took to scan a 300dpi A4 colour page. Monochrome A4 copies were much faster at 40 seconds. Faxing also seemed a bit slower using hard originals, but PC faxes were notice-



ably faster. If you want colour copying, faxing and photorealism in one hit, this device will do it all without giving you a headache.

■ Distributor	Canon
■ Phone	(02) 9805 2000
■ Online	http://www.canon.com.au/
■ Price	\$999
■ In short	Compact, effective, sophisticated software, excellent quality scanning and printing.

OfficeJet 710

HEWLETT-PACKARD

Despite being a fully functional fax, colour printer, copier and scanner, the OfficeJet 710 deserves praise simply for being unobtrusive. It is no larger than a standard printer yet scans, prints and faxes in colour. Unfortunately, it only copies directly in mono, but you can't have everything.

Hewlett-Packard has moved away from its usual paper path and situated both plain paper and scan-original feed trays upright at the back of the case. This saves space and allows output (both originals and printed output) into a front tray. Setting up is highly automated, and the supplied software CD paces you through each step in a very helpful way. The front panel is very simple — just a numeric keypad and Stop/Go/Copy buttons to worry about. A two-line LCD completes the controls.

The inkjet cartridges (a three-colour plus a separate black) hide under a front cover, as does the scan head. The connections on the back panel include a bi-directional parallel, plus a phone connector box with outlets for phone, answering machine and modem. The manuals are basic, but very well laid out and more than enough to get a new user started.

This is no hardship, however, thanks to the superb software that drives the whole thing. Pop an original in the 20-sheet feed tray, and the OfficeJet Manager

software autoboots to ask if you want to fax, copy, scan or email. Simply click the correct button and the software pops up the correct utility onscreen. Other bundled software includes OmniPage OCR and Adobe PhotoDeluxe.

Scan and print quality are both excellent, and a neat Image Viewer software utility is available to optimise images if required. Some slipping was noticed when feeding high-gloss originals through the scanner, but the 300dpi optical results were very good. Print quality was excellent. Plain paper output was very crisp on both colour and mono for both printing and copying — for some reason, the latter is mono only, unless the computer is used to control the job.

Mono resolution is 600dpi, and colour 300dpi. A snap-in photorealistic cartridge option is available. As a one-stop solution, this unit has to come pretty near the top of any SOHO buyer's short list.

■ Distributor	Hewlett-Packard
■ Phone	131 347
■ Online	http://www.hp.com.au/
■ Price	\$995
■ In short	Compact, effective, colour input and output, user-friendly software and optional standalone operation — it has it all.

OfficeJet Pro 1175C

HEWLETT-PACKARD

The OfficeJet Pro 1175C's design is based more on that of a photocopier than a conventional printer or fax. The print engine is completely separate and fits underneath the top-mounted flatbed scanner, which has a lift-up cover similar to most office photocopiers. This makes the unit look huge.

Although submitted as an MFD, and bundled with WinFax Pro, the 1175C doesn't have a built-in fax modem. The system assumes the host PC will have one installed. The scanner is a quality 300dpi colour item, and was notably faster than any of the page-feed competition at 29 seconds for a full A4 colour sheet. Image quality is good, but no better than the Canon C50 or Brother 7160c. The 30-sheet motorised document feeder sits at the back of the lift-up lid.

The CMYK print engine was also quite fast, pumping out a 300dpi A4 colour image in about two and a half minutes from some reassuringly large print cartridges. Copy speed was even brisker — an impressive quality full-page image dropped into the out-tray in a couple of minutes. Images



were a little tonally dull on plain paper, although sharpness was good.

Scanning into the PC using the bundled Picture Scan software was easy, but the software allowed none of the advanced image adjustment of the OfficeJet 710's ImageViewer or Canon ScanGear applications. Scan results were smooth and accurate, but seemed a little dark compared to some other machines. This was borne out by a print of the scan, which had a slight dark cast.

But where the 1175C really came into its own was producing high-quality enlarged or reduced copies. The internal digital smarts produced truly stunning results, even up to 300% and 400% enlargements, and the digital sharpening reduced jaggies and blurring to an absolute minimum. The package bundles OmniPage OCR and Adobe PhotoDeluxe, as well as WinFax and a central manager applet, which is less user-friendly than the 710's Scan Manager. The manuals are the usual Hewlett-Packard — well written and concise.

Overall, a very capable scaling colour photocopier with print and scan capabilities. But remember, you need an extra fax modem to match the capability of the rest of the pack, and that will add a couple of hundred big ones to the bottom line.

■ Distributor	Hewlett-Packard
■ Phone	131 347
■ Online	http://www.hp.com.au/
■ Price	\$1,875
■ In short	Fast, high-quality scanning and printing, plus brilliant copy capability; but it lacks a fax modem.

Okifax 5200

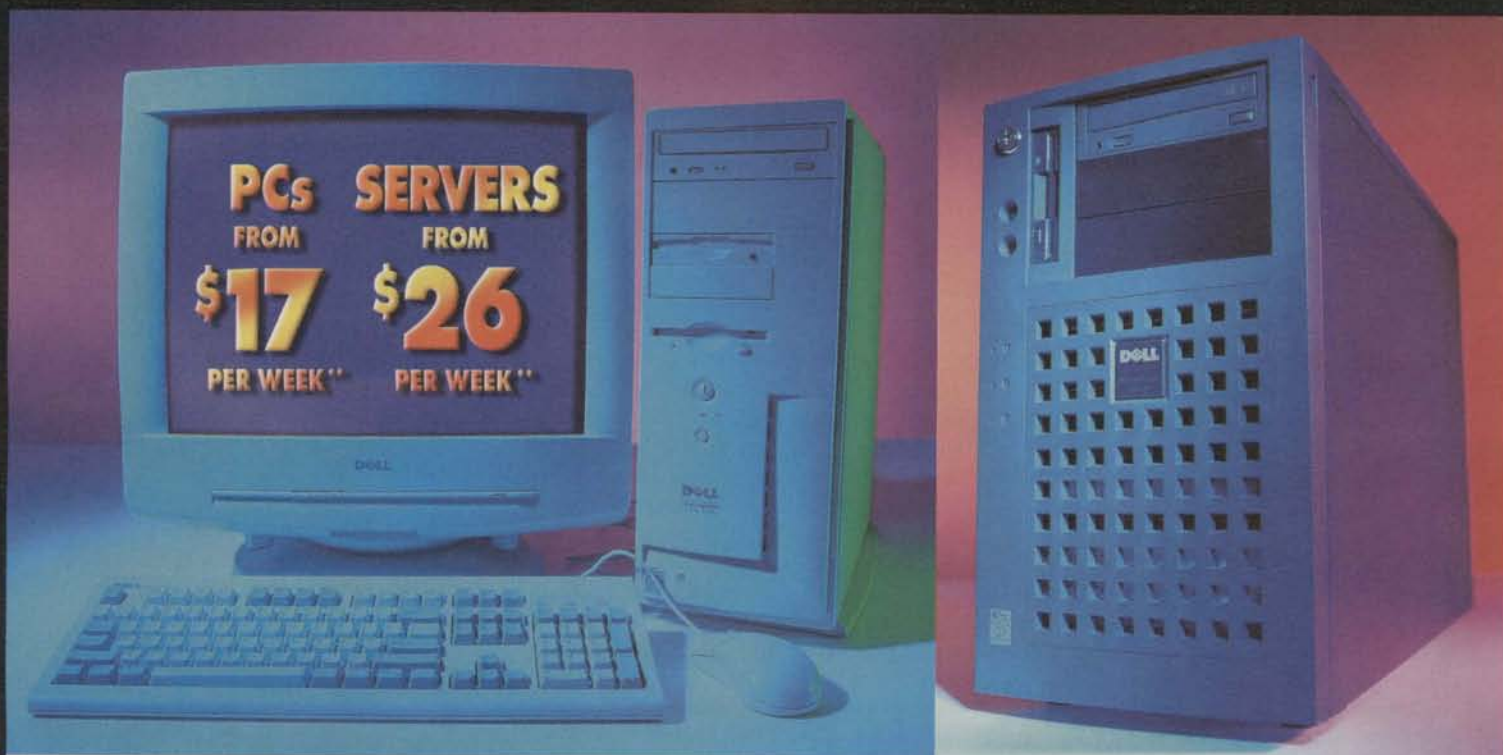
OKI

The Okifax 5200 is compact, squat and built to last. It has some of the neatest feed and delivery tray designs, and the laser cartridge and drum are very easily accessed. Sadly, other aspects of the Okifax don't fare so



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DELL0084/APC/SMA

well. The copier is line art only (no halftones or shades of grey), it is slow, makes a lot of noise, and uses a really obtrusive scan output tray at the back. There are a few bright points, but there is more promise than delivery, especially when compared to the cost benefits of the inkjet opposition.

Setting up is pretty straightforward, and the unit does have a good array of phone sockets (three for additional phones and answering machines), plus power and printer sockets. The feed tray is very neat and slips under the print section with up to 250 sheets onboard. Up to 30 originals can be loaded into the front of the scan unit, and they exit into the previously mentioned tray.

The supplied software is based on the well-known JetFax, which works much like Canon and Hewlett-Packard's manager packages. It allows faxing, printing, scanning and copying from one interface, as well as archiving and image manipulation. The manual is very comprehensive as far as hardware setup is concerned, but software manuals are on the CD, so you have to load it before you can read them — curious logic.

Print output is not given in dpi, but looks to be about 300dpi with image enhancement. Scan resolution is 200 by 400dpi maximum, but the JetFax driver offers a good range of lesser options, plus OCR if required. Scanning is pretty slow at just under four minutes for an A4 scan, but the quality is reasonable.

The copy facility is very noisy. It only copies in line art and is not really suitable for photos. The control panel allows the Okifax to be used as a standalone unit and is notably easier to understand than some. All the main functions are one-button operational — there are no tricky function or shift controls. Faxing, copying and printing can also be completely controlled from the PC. Print output was also surprisingly slow, and took over a minute to print an A4 screenshot — even after spooling was finished. Despite its very good fax capability, the Okifax was a bit of a disappointment. Given the price, it should do more.



Distributor	IPL Datron
Phone	(02) 9690 8200
Online	http://www.oki.com/
Price	\$1,999
In short	Solid and mostly well equipped, but let down by average scan and print capabilities.

KX-F1110AL

PANASONIC

At first glimpse, this unit looks more like a standalone telephone answering machine (which it is) than a PC peripheral. But in terms of functionality, the KX-F1110AL is a surprisingly comprehensive package.

The approximately 200dpi printer is a thermal film unit which prints happily on plain paper. The scanner is also capable of OCR quality (just), and output quality from both faxes and PC sourced originals is acceptable for most business needs. However, you do get what you pay for, which is a workable comms unit. The casing is very compact, but it has an overdose of buttons on the front panel — 34 in all. These are clearly labelled to avoid confusion, and the manual helps out with clear instructions and diagrams.

The connections are a bit sparse, with power, phone-in and RS-232 serial sockets being the sum of I/O. No extra phone or modem jacks are fitted, although the inbuilt digital answering machine and handset make this largely unnecessary. The feed trays protrude slightly from the rear of the casing, but clever design means the document feed tray only flips out as and when needed, saving space and offering a clean profile. Print output from PC and fax was acceptable, but nowhere near the inkjet or laser category. The supplied film cartridge lasts for only 60 pages, which won't break any consumable records either. Copy output quality was slightly better than the Ricoh, and sent faxes were clear and crisp.

The supplied software does much the same as the Hewlett-Packard OfficeJet Manager, but with less flair and fewer cute animations. There are some neat touches such as the digital voice which tells you faxing and messaging are under way, in addition to screen feedback. The Message Centre software also allows comprehensive filing and archiving of images and faxes. However, the overall quality of both scanning and printing seems aimed at standard thermal fax output benchmarks, not PC standards.

Taken as a complete package, the KX-F1110AL has lots of ticks in lots of boxes,



especially for SOHO users who are not looking for top quality or massive print runs. But if quality scanning and printing are high on the list, those ticks will be very small.

Distributor	Panasonic
Phone	(02) 9986 7500
Online	http://www.panasonic.com/
Price	\$899
In short	Lots of smart design, software and features, but overall imaging quality is not its strong suit.

UF-342AL

PANASONIC

This unit is Panasonic's big hitter in the MFD stakes. It's big anyway, looking more like a departmental laser than a modest inkjet-based all-in-one device. Under the hood is the twin-cartridge inkjet engine, a 150-sheet paper tray, a 200dpi mono scanner and a lot of space.

The front panel is impressively simple, incorporating a keypad, a 28-strong array of preset programmable number buttons, and large coloured Stop, Start and Copy buttons. That's all there is to confuse anyone. There are function and resolution buttons available, but they hide under a flap which lifts up and doubles as a feed tray for the scan aperture. Overall, it has a very neat design.

Paper feed is from a bottom tray, with output dropping on the top of the feed — very much like Hewlett-Packard's early models, although the mechanics appear to be based on Canon components. Setup is driven via the LCD on the front panel, which tells the user what to do to get everything up and running.

Connectors for printer and phone are supplied, as well as the integral handset. An answering machine can be connected if required. The bundled software — Panafax MFS image manager plus a TWAIN driver — recognises the unit and sets up faxing, scanning, printing and address book applets automatically. Using the UF-342AL as a copier is simple, partly



because there are no options. Same size, mono line art is all that's on offer, so forget smooth halftones or reductions.

Printing from the PC produces surprisingly good results: clean and sharp images in both mono and colour, with no wrinkling evident, although the ink did stay wet for some time. The 600dpi print was slow, however, taking five and a half minutes to complete an A4 colour sample, and the 100-page colour cartridges are unfashionably small and would probably require frequent replacements. Scanning into the PC is similar to the copier — not terribly sophisticated. A superfine scan offers reasonable quality for OCR at 200dpi, but no greyscale options are available. When compared to the opposition, the price of this unit — both up-front and in ongoing costs — make it a bit pricey for what it offers.

■ Distributor	Panasonic
■ Phone	(02) 9986 7500
■ Online	http://www.panasonic.com/
■ Price	\$1,999
■ In short	Good looking, chunky and easy to use, but with middle-of-the-road scan and copy performance that doesn't justify the relatively high price.

FAX 1750MP

RICOH

The 1750MP is a compact fax-like box. It has the usual numeric keypad, a set of dial and function buttons, plus a two-line status LCD. The 150-sheet plain paper feed tray is situated at the front bottom of the casing, and output is into a near-vertical tray at the top. This leaves room for the scan/copy original tray at the front, allowing up to 30 sheets in auto-feed mode.

The print engine is a 300dpi, 6ppm laser, with what Ricoh calls EET to give a claimed pseudo-600dpi resolution. The scanner is a greyscale-only, 200dpi, 16-bit page-feed unit. This, combined with a 700K internal memory which stores images prior



to filing or faxing, allows a very rapid sub-three-second physical scan. There is also the usual bi-directional parallel port, plus line-in and extension RJ-12 phone sockets for connection to a Telstra socket.

Access to the toner cartridge and potential paper jams is very well thought out, and setup is straightforward and obvious. Supplied software is the special WinStyler print driver software (both Windows 95 and 3.x versions), and Cheyenne BitWare fax manager software, both supplied on floppy. In use, the 1750MP presented no major problems, either via the PC, or when used directly through the front-panel controls. Direct operation offers some useful copy-sizing options, water-marking and collation too, plus memory fax storage if the line is busy or a print is in progress. Fax broadcast and up to 60 speed-dial options are also available.

When driven by software, the 1750MP offers less sophistication than other models. The bundled TWAIN driver is fairly basic, with only line art, dithering and error diffusion as options — no resolution controls are offered. No OCR or imaging software is included either. The two manuals are both useful and comprehensive, if a little staid in approach.

Print output is reasonable for a 300dpi unit, but some blurring when making direct copies was evident. Overall, the whole package offers neat design, functionality and convenience, but is restricted by the quality of the scanner. As a smart fax, the 1750MP has a good ergonomic design, but the uninspiring scan and print resolutions limit this machine's usefulness as a PC peripheral. Overall, the Ricoh's price is hard to justify given its performance.

■ Distributor	Ricoh
■ Phone	(02) 9690 8200
■ Online	http://www.ricoh.com/
■ Price	\$2,999
■ In short	Good design features and operation let down by low resolution and basic software capability.

FO-1660M

SHARP

This MFD is the cheapest of the bunch and combines all the major elements of fax, phone, copier, scanner and printer in a very compact package. But you get what you pay for, and quality input or output is not top of the FO-1660M's attribute list.

The core of the machine is its 200dpi plain-paper thermal-transfer printer. This is assisted by a 200dpi mono scanner which claims 64 greys, but when either scanning into the PC or copying looks more like about six. It isn't line art, but it isn't far off.

Setting up is straightforward, thanks to the single in and out connectors, plus all the bundled software on an autorun CD. The connections are slightly unusual in that the box has a standard phone line-in jack, plus a printer-out RJ-45. The latter connects to a PC interface box which in turn connects to a standard serial cable, and then to the RS-232 port on the host. This slightly circuitous but workable system is driven by the supplied Sharp Multi-Function Interface (Version 3.1) which loads separate fax, TWAIN, scanner viewer and filing applets onto the host. These are not integrated in the same way as the more expensive or more recent systems, and require more delving into command trees to get things done. Xerox's TextBridge Pro is also supplied, and the scanner handles line art well enough to provide good results when scanning text documents.

The direct controls on the front panel are similar to the FO-2150CM, and are easy to understand and program using the bold LCD readout. The 200-sheet paper feed and 20-page original document slot both sit on the top of the machine, with output at the front, but the scanner feed had a habit of jamming and crumpling originals on the unit we tested. A good set of fax controls is built in, for polling, junk fax refusal, broadcast and macros for combinations of these.

The print speed was reasonably brisk at about 40 seconds or so for an average



page, but slowed to about one minute if lots of images were produced. Scanning was either text or photo — limited options were given in the TWAIN scan window, and was pretty rapid even at a worst of two minutes and 16 seconds for a photo image.

But the overall impression this machine gives is of a budget device. The output isn't that brilliant on small text, and detailed images get really fuzzy. Add to that a manual that gives full mechanical details but no software instructions (they're all on the CD in PDF format) and you have a machine that does everything, but in a limited way.

■ Distributor	Sharp
■ Phone	(02) 9830 4600
■ Online	http://www.sharp-usa.com/
■ Price	\$699
■ In short	More a souped-up fax than an all-in-one device. It's cheap, though.

FO-2150CM

SHARP

You can say one thing about the FO-2150CM — it looks different. Although the makers don't mention it, it is based around Lexmark mechanics, and has inherited the upright stance, offering a tiny footprint with good accessibility. We tested a pre-production machine.

The keypad and controls are similar to the Canon C50, with the addition of a handset and front-feed document tray underneath the button and LCD panel. The RJ-12 line-in jack is complemented by an answering machine jack, and a standard parallel interface. Output from the 200-sheet feed tray on top is squeezed out of the very bottom of the casing, into a startlingly curvaceous output tray.

Access to the 200dpi (400dpi interpolated) scan head is good, but getting at the print head and generously sized cartridge is quite tricky, as both are hidden under the scan tray. The single-head print unit comes with both black and three-colour cartridges, and there is a clever cartridge holder/preserver built into the rear of the casing. Setting up is easy (luckily, as the prototype manual is a bit hazy in parts) thanks to prompting by the status LCD.

Software is based around the Sharp MF Interface, which gathers scan, copy, email/fax and print into one PC menu, along with file management. This is not quite as slick as PaperPort or Hewlett-Packard's OfficeJet Manager, but it does offer separate TWAIN drivers for scanning directly into other apps. Corel Print House and Xerox TextBridge Pro are also included.

The range of options available from the scan software is a bit limited, but adequate for the scan quality available. Some of the direct actions seemed rather illogi-



cal, and direct copies were also on the slow side at two minutes. The sample machine couldn't cope with greyscale.

Colour output from the PC was up to the usual Lexmark quality — a bit speckly on tonal graphics, but very sharp on plain paper. No exchange of voice, data or answering capability is built in, but apart from that, the FO-2150CM seems to offer a well-rounded, reasonable-quality package for a reasonable price. If you don't need high-quality colour scans, then this unit is well worth a look.

■ Distributor	Sharp
■ Phone	(02) 9830 4600
■ Online	http://www.sharp-usa.com/
■ Price	\$749
■ In short	More like a colour printer with some add-on smarts, but still good value for tiny offices on budgets.

Product/Distributor	Price	Scanner	Printer	Resolution (dpi)	Fax	Copier	Phone handset	Size (cm) (H by W by D)
Brother MFC-6650MC Brother, (02) 9887 4344	\$1,399	400dpi mono	Laser	600	Group III	Mono, sizing	Yes, answer machine	28 by 45 by 34
Brother MFC-7160C Brother, (02) 9887 4344	\$1,099	600dpi colour	Colour inkjet	1,440 by 720	Group III, 3D colour	Colour, sizing	Yes, speakerphone, answer machine	27 by 53 by 49
Canon MultiPass C20 Canon, (02) 9805 2000	\$749	200dpi mono	Colour inkjet	720 by 360	Group III	Mono, sizing	Optional extra	23 by 40 by 38
Canon MultiPass C50 Canon, (02) 9805 2000	\$999	360dpi colour	Colour inkjet	720 by 360	Group III	Colour, sizing	Optional extra	23 by 40 by 38
HP OfficeJet 710 Hewlett-Packard, 131 347	\$995	300dpi colour	Colour inkjet	600	Group III, ITU colour	Mono, sizing	No	25 by 44 by 36
HP OfficeJet Pro 1175C Hewlett-Packard, 131 347	\$1,875	300dpi colour	Colour inkjet	600	N/A	Colour, sizing	No	44 by 54 by 36
Oki Okifax 5200 Oki, (02) 9690 8200	\$2,000	200 by 400dpi mono	Laser	300	Group III	Mono	No	25 by 33 by 43
Panasonic KX-F1110AL Panasonic, (02) 9986 7500	\$899	200 by 400dpi mono	Thermal	200 by 400	Group III	Mono, sizing	Yes, answer machine	19 by 36 by 37
Panasonic UF-342AL Panasonic, (02) 9986 7500	\$1,999	200dpi mono	Colour inkjet	600	Group III	Mono	Yes	26 by 41 by 47
Ricoh Fax 1750MP Ricoh, (02) 9690 8200	\$2,999	200dpi mono	Laser	300	Group III	Mono, sizing	No	29 by 38 by 39
Sharp FO-1660M Sharp, (02) 9830 4600	\$699	200dpi mono	Thermal	200	Group III	Mono, sizing	Yes	28 by 36 by 49
Sharp FO-2150CM Sharp, (02) 9830 4600	\$749	200dpi mono	Inkjet	600	Group III	Mono, sizing	Yes	36 by 40 by 34

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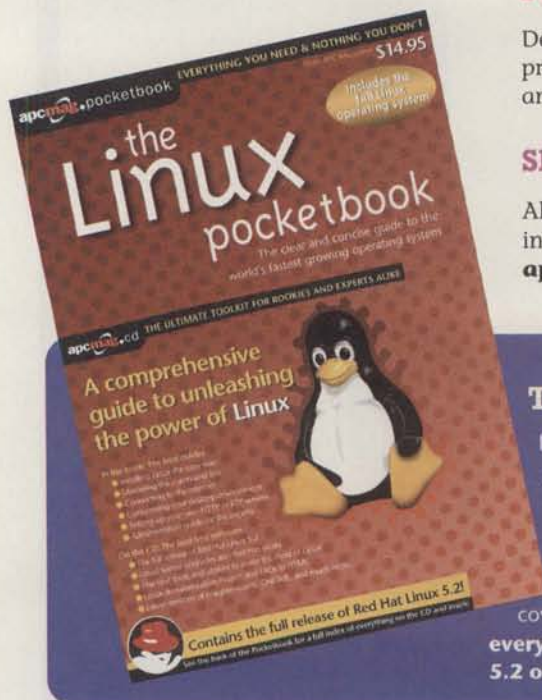
Workshop

88 APC Magazine

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Welcome to Workshop, the section dedicated to bringing you all manner of tips, interesting information and do-it-yourself tutorials. Within these pages you will find useful shareware, informative operating-system-specific columns and easy-to-follow programming tutorials.

If you've been looking for the *Linux Pocketbook* but have been unable to find it, fear not, it should be available by the time you read this. We've been printing extra copies to keep up with the demand, but if you are still unable to find it at your local newsagent you can purchase it online from apcmag.com/shop.



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All the files mentioned here can be found in the Workshop section of this month's apcmag.cd.

The Linux Pocketbook

Interested in Linux? Make the most of your PC and find out why Linux is the world's fastest growing operating system. The *Linux Pocketbook* has everything you need to get started, including the operating system on the cover CD. **On sale NOW at newsagents everywhere. Comes with Red Hat Linux 5.2 on the cover CD!**



Bug of the Month

Well, I guess it had to happen eventually. All this time we've spent laughing at other people's bugs and finally someone has pointed the finger right back at us.

This month's bug comes from Net identity Daniel Bowen, author of the infamous Toxic Custard mailing list.

On the December apcmag.cd we provided the usual selection of links to nifty online resources. Curiously, the notes for Microsoft Office 97 SR2 included a link to <http://www.lotus.com/>. Hmmmmmmmm.

Either one of our HTML designers needs a remedial course in cutting and pasting or else we've just uncovered the scoop of the century. Where's Angus Kidman when you need him?

Actually, I'm pretty sure that Daniel only sent us this in the hope that we'd plug his Web site at <http://www.toxiccustard.com/>, but of course we're not going to fall for such an obvious ruse.

Even though he's probably rich and famous and can afford to buy his own software, we'll still send Daniel a prize. We're nice like that.

Michael Smith

Get involved

All files mentioned in Workshop can be found on apcmag.cd or downloaded from our Web site at <http://www.apcmag.com/>. You can join one of our online discussion forums to discuss technical issues or just voice your opinion on any related topic.

Workshop is a reader-input section. Please contact us with any ideas, comments or criticisms via email to workshop@acp.com.au, or snail mail to APC Workshop, PO Box 37, Sydney NSW 1028.

Ashton Mills and Stephen Withers,
Workshop editors

Win! Win! Win!

Workshop is on the lookout for the most interesting, strange, funny or downright weird software bugs you can find. These include code snippets, examples of features that function poorly, or procedures for crashing a particular application. Anything and everything that is buggy deserves mention.

Send us your favourite bug via email to bugs@acp.com.au or snail mail, and you'll be in the running to win your choice of **development or application software** from Workshop's prize cupboard. The prizes change each month to ensure there's always something interesting for avid bug-hunters. Feel free to send screen captures or example code listings, as well as details of how to duplicate the bug, if applicable.

Winners will be announced in the April edition of APC, and the winning bug will appear in the Bug of the Month column. So start hunting!

A new series on networking, starting with a look at the OSI reference model. **By Nathan Taylor**

Technobabble

Most texts discussing networks usually start off with the increasingly redundant 'network topology' diagram, because it's a nice, easy way for beginners to start the difficult process of understanding computer networking. We're going to try something a bit different: we'll throw you right into the deep end with the Open Systems Interconnection (OSI) reference model.

Ratified by the International Standards Organisation in 1984, the model was designed as a reference to direct network product manufacturers, in the development of protocols that would seamlessly interact with each other. The truth is that very few protocols have been developed which fully comply with the model, but it has become fundamental in describing and categorising existing protocols and products, as you will see in the coming months, when we delve further into the black arts of networking. It is particularly relevant when you start talking about switches and routers — the devices that make networking beyond very small workgroups possible.

Understanding the OSI reference model is not the easiest thing in the world. It will take most people some time to grasp its relevance, and understand the model for what it is: a schema that makes most networking, especially inter-networking, possible. Perhaps the best way to start is to envisage it using the layered 'hole' analogy.

The model is made up of a number of 'layers', ranging from the physical layer up to the application layer. Each layer of the reference model provides a set of messages, usually involving a header message and a tail, but leaving a hole in the middle. The next layer is responsible for filling this hole — which it does with its own header and tail, plus its own hole. The next layer after that does the same, and so on. Each subsequent layer adds some functionality, or, in OSI terminology, uses the previous layer to build enriched functionality.

So, starting at the bottom, each layer

The OSI model layers



adds its bit of information, until you get to the top layer, where the user's data is entered into the final hole. Once this is done, you have a complete package of information, ready to be converted to voltage levels and put on the cabling that makes up the network. The information contained in the headers will tell the network where to send the package, how to get it there and which application it relates to, depending on the information provided by the appropriate layer.

This is often illustrated in a diagram that looks like the figure on the next page. This is a simplistic way of describing it, but it is a handy way to understand how the layered approach works. In the middle, you have the actual data you want to send, surrounded by the layers of information that tells it how it gets to its destination, and what the target device should do with it.

There are good reasons for this layered approach — the most obvious being nominally independent layers. Each

layer can be developed separately, and simply made to interoperate with lower layers. Without this approach, applications and transports would have to be seamlessly integrated, and things like the Internet (which uses TCP/IP, on top of which numerous applications like email and HTTP can be built) would not be possible.

Networking protocols can be developed for seven layers, from the application layer to the physical layer. In different networks, layers can be represented by different protocols, but the structuring of the protocols should be the same. So you should be able to run TCP/IP (a layer 3/layer 4 protocol) on either Token Ring or Ethernet (both layer 2 protocols), assuming you have the right bindings in the software to map TCP/IP to the 'hole' provided by either Token Ring or Ethernet. Don't understand what I'm talking about? Then read on.

A look at the layers

The first layer, or bottom layer (see the diagram on the next page) is the physical layer. This layer is fairly self-explanatory — it defines the physical signalling techniques for the communication system required. It encodes and decodes bits for transport between network devices. A layer 1 protocol, for instance, might have specifications to deliver data over copper wires, while another might contain details of the signalling techniques, frequencies and start/stop bits for coaxial connections. This depends more on the network interface card than the software running on the host computer.

Just above this layer is the data-link layer. It gets a bit more complicated here. The data-link layer transmits data from one network device to another, based on the *physical address* of the devices. It's essentially a Point-to-Point Protocol, allowing two devices to actually communicate with each other — but it does not

define how two devices should *find* each other on the network. We can make an analogy to an airline to better understand this. If you have a direct flight between destinations (use a single cable), there is no problem, you can get from point to point without much difficulty (the devices connect via a single path). But if you required a connecting flight (connection to another network segment), you would have difficulty finding your way (the protocol does not navigate the network to make sure devices are connected).

Ethernet and Token Ring are examples of layer 2 protocols, and bridges and layer 2 switches are devices that operate at layer 2, taking care of the issue of connecting devices. In an Ethernet environment, the data link layer is also responsible for breaking the data into frames, which enable delivery of data across a busy network where many clients are competing for space on the carrier cables. We don't have the space to discuss these right now, but we will look at these terms in the next few months.

In OSI-based networks, every device will have a Data Link Control Identifier (DLCI) which is its unique identifier on the network. Unfortunately, more often than not, especially in Ethernet networks — the most common type of corporate network — Institute of Electrical and Electronics Engineers (IEEE) parlance is used instead. In IEEE 802 (the number is the standard reference) the Data Link layer is actually divided into two sub-layers: the Media Access Control (MAC) address and the Logical Link Control (LLC) layer. The MAC address essentially means the same thing as the DLCI. The LLC is designed to provide a uniform interface to the layer above, the network layer.

Layer 3, the network layer, finds other devices on the network and sets up end-to-end delivery of messages. A layer 3 protocol is essentially responsible for setting up network addresses for devices connected to the network, and mapping them to the data-link layer's DLCI or MAC address. Many people will be familiar with the concept of IP (Internet Protocol) addresses on the Internet, which is each network device's universal identifier, allowing other devices on the Net to find that device. Well, IP is a layer 3 protocol. IPX, used in NetWare networks, is another example of a layer 3 protocol.

If we return to the airline analogy, the

layer 3 protocol would have the job of directing all passengers to make sure that all connecting flights were made. Routers and layer 3 switches operate on layer-3 protocols.

The fourth layer is the transport layer, and it takes care of transmission control, rather like flight attendants, pilots and airport staff in our airline analogy. It's concerned with issues such as the safe, intact arrival of messages or retransmission if they do not arrive. It

to applications. It's often said that they're inseparable, and protocols like the hypertext transfer protocol (HTTP) and simple mail transfer protocol (SMTP) often bridge all three layers.

The session layer, or layer 5, is somewhat complicated. It has the task of managing the activities of all the layers below it. It sets up virtual connections between network devices — similar to the process of dialling a phone. It makes and holds the connection between devices as neces-

sary, before 'hanging up' when no longer requiring the connection. The name of the layer can be a little misleading — sessions, in networking time, may be only a fraction of a second — enough to send a few bytes of information to terminate the session. When you download a Web page, your browser uses HTTP to set up a session with the server of that page. The HTML code is received by your browser, and the session ends.

Layer 6, the presentation layer, defines how this data is actually formatted. It is responsible for presenting the data in a way that the receiving device can understand — for instance ASCII text or binary data. Again, HTTP defines the format for the presentation of the data, in this case hypertext (which is actually just ASCII text).

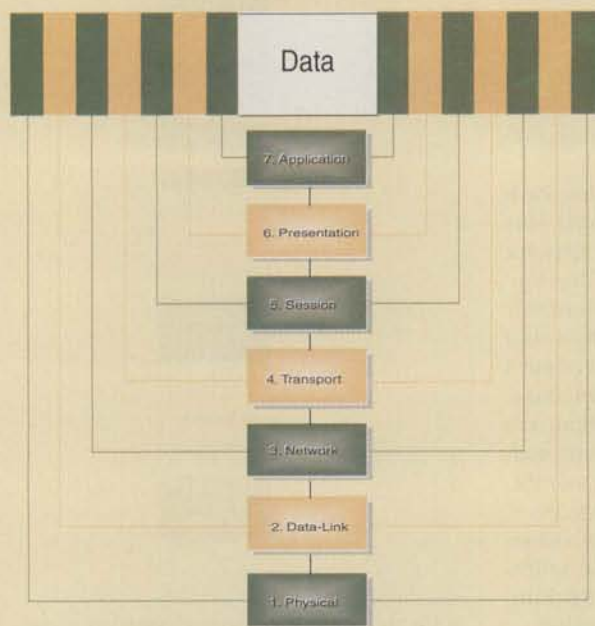
Finally, at the top of the heap is the application

layer, layer 7. This simply represents the user-accessible applications of the network, for instance Web services or email services. Other examples include network file transfer, terminal sessions and network directory services. Simply put, any end-user application that interfaces with the network can be considered to be using the application layer.

That's it. I've glossed over some of the detail, but this should give you a good lead into next month's topic, where we start dispensing with theory and get down to the nitty-gritty.

Next month: We'll put your new expertise in the OSI reference model to good use when we look at the machinery of the network: bridges, routers, hubs and switches.

The layered approach



While not completely realistic, this is a useful way of picturing the OSI model — as a layered 'package', with each layer providing a bit of extra transport information as we move towards the centre, where the actual data lies.

lets the receiver know that a message is imminent, makes sure the message does not arrive too fast or out of order, and may even require receipt recognition. IP's partner in crime, the Transmission Control Protocol (TCP; together these form TCP/IP, the basis for all communications on the Internet) is an example of a layer-4 protocol. Similarly, SPX, the partner to IPX in NetWare systems, is a layer-4 protocol.

These bottom four layers form the core means of actually providing a mechanism by which data can be transferred over a network. The top three layers, however, operate a bit differently. Layers 5 to 7 deal with user-level protocols for setting up connections between hosts, presenting data and providing interfaces

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Preventative maintenance — a stitch in time saves nine. **By Daniel Rutter**

Step by Step

Preventative maintenance is about the most boring PC-related subject there can be. It might even beat databases and accounting software, but nobody knows, because whenever they try the comparison, they fall asleep. But it can save you a lot of pain and money, and it's simple enough to do, so it's worth knowing.

Dust

Most things don't need to be dusted. This may sound like 'Standard Adolescent Argument Number Three', but it's true: the amount of dust sitting on a telephone, clock or hi-fi speaker is pretty much irrelevant to its operation, provided there's not so much that you can no longer locate the device in question.

Computers are different, as they continuously suck in air for cooling. A large portion of the dust from that air stays inside the computer. By and large, dust is not conductive and can't get into delicate assemblies like hard drives — hard disks have little air filters and no throughflow ventilation — but it can, and does, form an insulating blanket on circuit boards.

Every chip in your computer radiates heat, and CPUs commonly radiate as much as a soldering iron. The more dust that settles in your computer, the more trouble these chips will have getting rid of the heat. Overheated hardware can cause errors, or just break down. And very dusty computers can also accumulate enough motherboard scunge to affect the contact of new expansion cards.

Computers with multiple case fans (generally a sucking fan at the front and the standard power supply fan blowing out at the back) inhale more dust, but the greater airflow blows more of it out the back as well, so they're not necessarily any dustier inside than single-fan units. A dust filter over the front fan will help a lot, but the filter does have to be cleaned periodically. Adding a square of filter-foam to computers that lack one is a worthwhile preventative measure.

If you use an ioniser to keep dust out of

the air, don't put it right next to your computer. Ionisers attract dust, and cause it to clump together and stick to the ioniser and everything near it. This keeps it out of your lungs and eyes, but can stick it all over your PC — inside and out.

Shifting it

An obvious choice for getting dust off electronic components is a vacuum cleaner, but this is not necessarily a great idea. Household vacuum cleaners are, for a start, much more powerful than is needed to dust a motherboard, and can and do

business end of just about any vacuum cleaner. Static electricity is, generally speaking, a Bad Thing for computers.

Many chips aren't static-sensitive at all, but the ones that are can be destroyed by a static discharge as small as 200V, which is a lot less than you can feel, and not nearly enough to make hair and scurf stick to the vacuum cleaner tube. Static electricity is also why you shouldn't use feather or other hand dusters on your PC; late night TV-advertised 'dust magnet' dusters are an even worse idea, because they're made to carry around a big static charge.

That said, it is possible to vacuum your computer. You can go to an electronics store and get one of those little \$25 battery-powered vacuum cleaners built for the purpose. These, however, don't actually work very well. Shop around a bit more, and for the same money, you can get an adapter kit for your big vacuum cleaner, with a suction-reducing ventilated collar, a flexible tube and a variety of miniature nozzles. If you have trouble finding a kit, try your nearest Jaycar Electronics store. It's best to leave the computer plugged in but turned off as you clean it, and touch the case metalwork periodically to ground yourself. Placing your hand close to the end of the nozzle will keep the static down.

The easy way

A simpler way to get dust out of your computer is with compressed air. This does not mean a machine shop compressor that can run an air-spanner and is capable of blasting a CPU through a wall; you're looking for a gentler breeze. Electronics stores sell cans of 'air duster' for less than \$15, and a can holds enough to clean a dozen or so motherboards. Air duster is a non-flammable, non-CFC gas which, depending on how much pressure you apply on the nozzle, will emerge at speeds from a gentle breeze to a hair-pinning blast. This, incidentally, makes an air duster a quite servicable practical joke prop.

Air duster is actually much the same stuff as freezer spray — it just has no feed tube in the can and a bigger nozzle. This



Air Duster is the simplest way to get dust out of computer gear.

suck loosely socketed chips clean off the board and into the dust bag. Using the curtain setting, if available, can prevent this — but it's not the only problem.

Most vacuum cleaners accumulate static electricity — old-fashioned belt-drive ones do a pretty good imitation of a Van Der Graaf generator, but the fast-moving air inside the plastic tube is enough to put a decent charge on the

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means that using an air duster upside-down will produce a white blast that'll chill whatever it's aimed at to 70 degrees below zero pretty much immediately, and empty the can posthaste. This isn't funny if it's pointing at someone, but is useful if you don't have proper freezer spray at hand but need to hunt a thermal fault.

Resist the urge to blast-clean dirty PC fan blades with the air-duster; if you spin the fan up to a zillion RPM, you may well fry its electronics.

Mouse maintenance

The mouse is the one component of your computer that obviously becomes much more annoying to use when it's dirty. You can, however, significantly reduce the rate at which your mouse gets filthy. The key is to use a textured mousemat — one with a surface covered with tiny undulations. The idea is that the crud falls into the valleys and the ball only touches the ridges, as opposed to the approximately 90% rubbish transfer efficiency of traditional fabric mats.

The canonical example of a textured mat is 3M's Precise Mousing Surface, available from better computer and office supply stores including, for some reason, Australia Post shops. The paper-thin 3M product is vulnerable to bending and gashes, though, so for high-traffic computers, one of the other textured-surface mats with a more conventional mousepad substrate is a better idea.

Smoking can harm your computer

Smoke arguably counts as dust, because it includes zillions of tiny particles. Gunk from cigarette smoke, though, is considerably harder to get rid of than ordinary dust, thanks to the various sticky organic compounds that all those quit-smoking ads keep showing us. Smoke builds up on mouse balls and rollers, especially if you habitually hold your cigarette in your mousing hand; so don't do that.

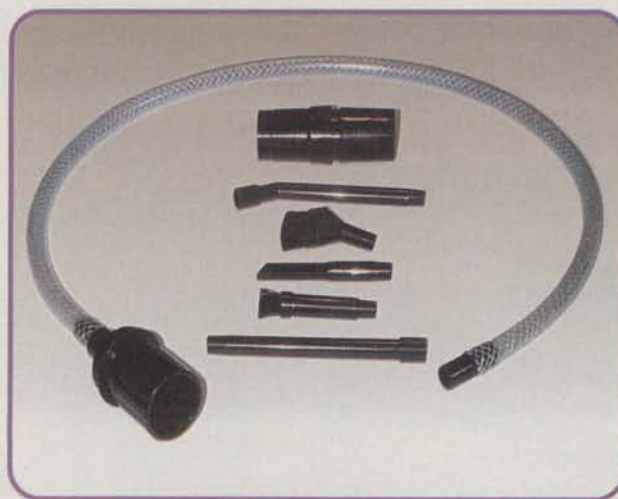
Smoke particles are plenty big enough to interfere with the operation of hard drives, but the only air flow into and out of a hard drive is the result of changes in temperature and atmospheric pressure, so there's no need to worry about your habit hurting your main hard drive.

Removable disk cartridge drives, though, are another story; many have quite complex dust-exclusion systems, but smoke microparticulates can defeat them. If you can stand it, keep the cigarettes away from the computer. If you need a dis-

placement activity, try not to make it drinking, since liquid spills are a much bigger hazard than smoke.

Magnets

Most computer users know to keep floppy disks and other magnetic media, including hard drives, away from magnetic fields. And most know that speakers that aren't magnetically shielded, and magnetised screwdrivers, and magnetic paper-



If you *must* use a vacuum cleaner on your computer, get one of these adapter kits to avoid damage.

clip holders, fall into this category. But the greatest threat to data comes from dynamic magnetic fields, not static ones. When you move a disk next to a magnetic object and then away again, the field strength across the disk changes, but it only does it once. An old-fashioned bell-ringer telephone, on the other hand, contains a rapidly pulsing electromagnet to activate the ringer, which makes a much better disk-eraser.

Monitor degauss coils are the things that make the monitor make that 'gonk' noise and the screen wiggle. They activate automatically when the monitor powers up, and are used to remove magnetic contamination of the tube assembly. They will also cheerfully degauss things left atop the monitor. And printers, especially older dot matrix models, frequently contain quite large and poorly magnetically shielded motors.

Clean power

I gave power conditioning the full treatment in the July 1998 Step by Step (page 146), but in case you missed it, here's the executive summary.

Regular household power is afflicted by surges, spikes and dropouts. These can kill computer gear outright or, more commonly, just hasten the normal death from old age of power supply and other components. Ordinary hardware store surge/spike filters are of little value. A proper 'line conditioner' with a dirty great transformer in it is much better. A standby power supply (SPS) or an uninterruptible power supply (UPS) is better yet, because these not only iron out supply irregularities, but can also keep you going through a blackout.

RFI

Radio Frequency Interference (RFI) is, generally, much more of a problem for devices trying to coexist with computers than it is for the computers themselves. Even with the case on, a regular PC will stuff up reception on any television with antennas less than several metres away. It is, however, not impossible for radio interference to corrupt data and cause other

mysterious errors, and you might as well not tempt fate.

Do not run long computer cables next to long power cables — they should, ideally, cross at right angles, and as seldom as possible. And don't use monstrously long cables where short ones will do; longer cables have more loss and are thus more susceptible to interference. That said, all wires act as an antenna for radio frequencies with a wavelength four times their length. This means a 75cm cable is well tuned to pick up 100MHz RFI. Bear this in mind if you live close to a major transmitter or other strong-tuned RF source, and use cables shorter or longer than the magic length. But if you don't see strange data corruption or network errors, don't worry about it.

And there's more!

Maintaining your printer is a topic complex enough to be worth its own column. And it's going to get it, next month. See you then!

Daniel Rutter welcomes feedback and suggestions at dan@dansdata.com.

Tuning and tweaking for performance and comfort.

By Kieran McNamee

Windows 95

The Windows 95 operating system leaves much to be desired for a lot of users. It's memory-hungry and isn't known for its robustness or stability. Then there is the confusion that takes place when you know exactly what you want to change in Windows 95 but have no idea of how to go about it.

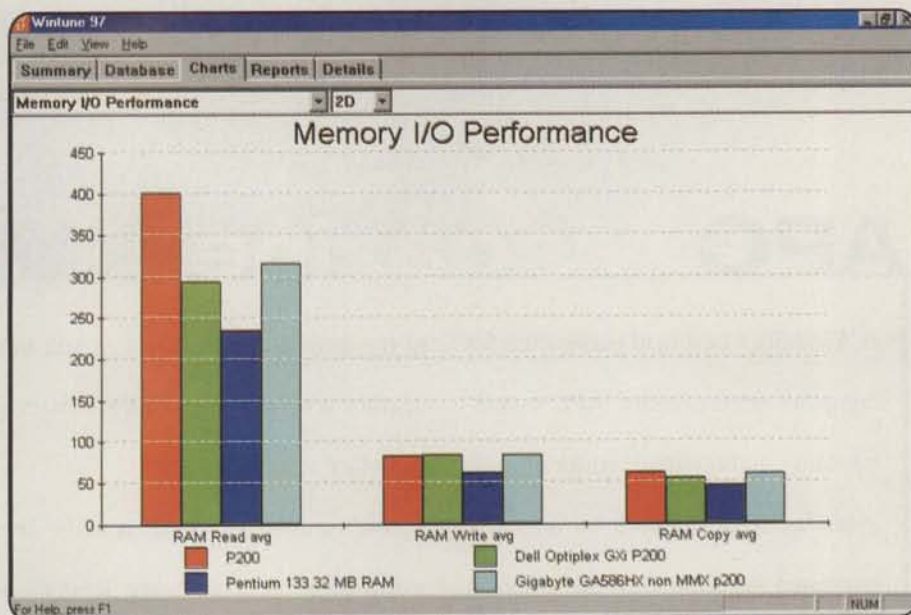
Well, in this column we will start by giving Windows 95 a tune-up so that it performs better, then we'll give it a few tweaks so that it looks and performs the way we want it to. All of the programs mentioned here can be found in the Workshop section of apcmag.cd.

Analyse your system

The first thing we want to do is see if our system is running optimally. The best tool for this is Wintune 97. This useful utility lets you see how your system rates against others, and will provide advice on how to make Windows 95 run better.

From my experience, Wintune always advises you to scan and defragment your hard disks on a monthly basis. If this is not already your standard procedure, you may want to commit this to memory and be sure to scan and defragment your system regularly. The ScanDisk and Disk Defragmenter utilities that come with Windows 95 are quite capable of doing their jobs, but you can purchase other utilities with more enhanced features.

While on the topic of defragmenting, a very useful performance-improving trick concerns the optimisation of your swap file by using Disk Defragmenter. The swap file, referred to as virtual memory, supplements your RAM and it is recommended that you set both the minimum and maximum limits to double the amount of RAM you have. So, if you have 32M of RAM then set both limits to 64 (or even higher if you have enough space). To get to these settings through the Control



Panel, click on System, Performance, then Virtual Memory.

However, before setting these limits, you can optimise the swap file by disabling virtual memory, restarting your system and then defragmenting your hard disk. By defragmenting the contents of your hard disk, you will be able to create a swap file that resides in one spot on the disk instead of all over the place.

Be warned that electing not to use virtual memory is a risky procedure — Windows 95 will be sure to point this out. Many systems will not load Windows 95 properly without virtual memory enabled, mine included. If your system won't run Windows properly, you can call up the System Startup menu (by pressing F8 during booting) and select the Safe Mode. You can run ScanDisk and Disk Defragmenter from Safe Mode.

If you are left in the prickly position of not being able to load Windows in either normal mode or safe mode, you will have to edit your SYSTEM.INI file to restore the swap file. From the DOS prompt, type

EDIT C:\WINDOWS\SYSTEM.INI. Scroll down to the Section titled [386Enh] and at the bottom of this section where it says "Paging=off", change it to "Paging=on". (This is just a precautionary measure and I doubt that any readers will have this trouble.)

Some third-party tools, such as Norton Utilities, can defragment the swap file without any of this rigmarole.

If you are lucky enough to have more than one hard disk, you may want to create your swap file on the most-used partition of the least-used drive. This rule ensures the highest performance benefits.

Another tip to improve the performance of Windows 95 for users with 24M of RAM or more is to set the typical role of the computer to Network Server. This can also be set in the System applet of the Control Panel. Instead of clicking on Virtual Memory, select File System. Here you can set the typical role of your computer, as well as set the read-ahead optimisation to full. While you're there,

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move across to the CD-ROM settings and optimise your CD-ROM drive. Move the supplemental cache size to full and, if appropriate, select the 'Quad-speed or higher' setting for the optimal access pattern.

A couple of things Microsoft left out

The developers of Windows 95 were aware that their operating system could have had a few more features to make it easier for users to configure it to their liking. To compensate for their omission, they have released two sets of tweaking tools, Windows 95 Power Toys and Windows 95 Kernel Toys.

The Power Toys set was created by the Windows 95 shell team, and is made up of 14 separate utilities. The utilities are TweakUI, TapiTNA (Telephony Taskbar Notification Application), Fast Folder Contents, Flexi CD, Cabfile Viewer, DeskMenu, Round Clock, DOS Prompt Here, Explore From Here, Shortcut Target Menu, XMouse, QuickRes, Send To X, and Find X.

For some good all around tweaking, the TweakUI utility is your best option. Once installed it can be accessed from the Control Panel, and its tweaking features range from setting the speed of the Start Menu to removing programs in the Add/Remove panel that have long since been deleted. Other Power Toys that you may find useful include QuickRes, which allows you to change the resolution and colour depth of your desktop without having to reboot; Xmouse, which makes the focus follow the mouse instead of having to click to change focus; and SendTo X, which adds a number of new commands to the SendTo menu.

The Windows 95 kernel team became envious of all the fuss that was made after the shell team released Power Toys, and they decided to create some of their own. There are only six tools in this set: Conventional Memory Tracking, MS-DOS Mode Configuration Wizard Customization Tool, Windows Time Zone Editor, Windows 95 Keyboard Remap, Windows 95 Program Monitor and Windows Logo key control for MS-DOS programs.

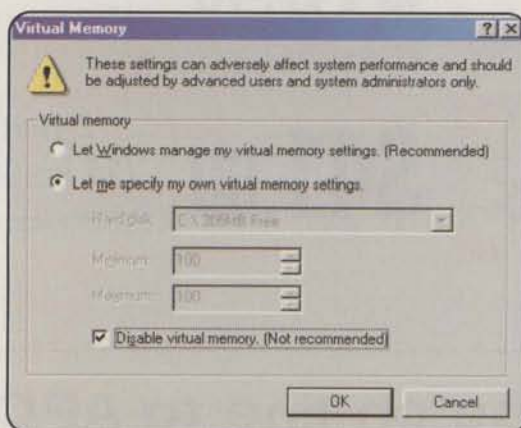
Out of these, the two that most readers will want to look at are the Keyboard Remap tool and the Windows Logo key control tool. Keyboard Remap allows you to set up the keyboard the way you want it. If you don't have a Windows 95 keyboard, you can define other keys to do the same things as the additional Windows 95 keys. You can use the Windows Logo key control

tool to disable the Windows Logo key, which, as gamers will know, can disrupt some games if pressed accidentally.

Additional tweaking tools

Now that we have the basic tuning of Windows 95 out of the way, it's time to make use of a few handy tools. These three tools, X-Setup, Start Menu Changer and the Windows Tweaking Toolkit, all have some brilliant features that allow you to customise the Windows 95 desktop to suit yourself. There are quite a number of similar tools available, but these three incorporate all the best features.

With more than 55 different tweaking functions, X-Setup has to be the most complete tweaking tool there is. It is a freeware program and I heartily recommend it to everyone. There are 18 panels that cate-



gorise all the tweaking options, and changing things is as easy as clicking on a checkbox or entering a value.

Some of X-Setup's tweaks which you may want to take advantage of include changing the Windows booting process, changing the name of the Recycle Bin, and setting the minimum and maximum limits of your system cache. Without X-Setup, tweaks such as these have only been possible by editing specific keys in the registry or lines in the SYSTEM.INI file. With X-Setup you can also clear histories and caches, change set-up options for Start Menu items and change how your CD-ROM drive works.

The Windows Tweaking Toolbox is not as comprehensive as X-Setup, but it provides a number of features that X-Setup misses out on. Options in the Start Menu can get in the way if you never use them. You can use the Windows Tweaking Toolbox to disable all the options in the first level of the Start Menu — from the Favorites and Documents options added

by IE4, to the Find, Run, Log Off, and even the Shut Down option.

To prevent others from messing with your system's settings, you can use the Windows Tweaking Toolbox to disable parts of the Control Panel. You can disable tabs in the Display Properties and then no-one will be able to change your screensaver or the resolution of your desktop. You can also disable the File System and Virtual Memory parts of System Properties so no-one can mess with settings such as those mentioned in the first part of this article.

As its name suggests, Smart Menu Changer is concerned with the look and functionality of the Start Menu. You can find most of its options in the other tweaking tools, but there are a couple of things many will find useful. Smart Menu Changer allows you to edit the label on the Start button, and also allows you to change the icon that sits on the left of the Start button. This is a great way to personalise your desktop.

If you click on the Start button on most Windows 95 machines, the Start Menu will have a banner on the upper left-hand side labelled 'Windows 95' (or 'Windows 98' if you have upgraded). With Smart Menu Changer you can personalise this banner. All you have to do is create a 16-colour bitmap with dimensions of 21 by 130 pixels (or 21 by 223 for Windows 98). A program such as Paint Shop Pro is perfect for designing this banner. Once created and saved, all you have to do is specify the bitmap's location, and the change will take effect on rebooting.

Linux: The tweaker's heaven

If the last two pages of tuning and tweaking tips have left you wanting more, then you may want to have a look at Linux. Linux is an OS where you can tune and tweak to your heart's delight. If you haven't already purchased the *Linux Pocketbook*, you might want to now.

Beginning next month, Workshop's Windows 95 column will be renamed Windows 98. However, this does not mean that we are abandoning all our Windows 95 readers. Most of the material covered will be applicable to both operating systems, because there isn't really that much difference between them.

Talking to your PC is one thing; having it listen is another. **By Christopher Relf**

OS/2 Warp

VoiceType seemed the killer application that would make OS/2 rise above the others. Unfortunately, VoiceType success stories are few and far between.

The way we communicate with computers, believe it or not, has improved over the years. The mouse was initially shunned, but now, in various guises, it is included with just about every desktop and laptop PC sold. So why not go one step further? If the design of the mouse was seen as so 'out there', surely talking to your PC is a more logical and natural step. It does have its problems, though. Nearly everyone can easily learn how to operate a mouse, but 'standard' talking is another story...

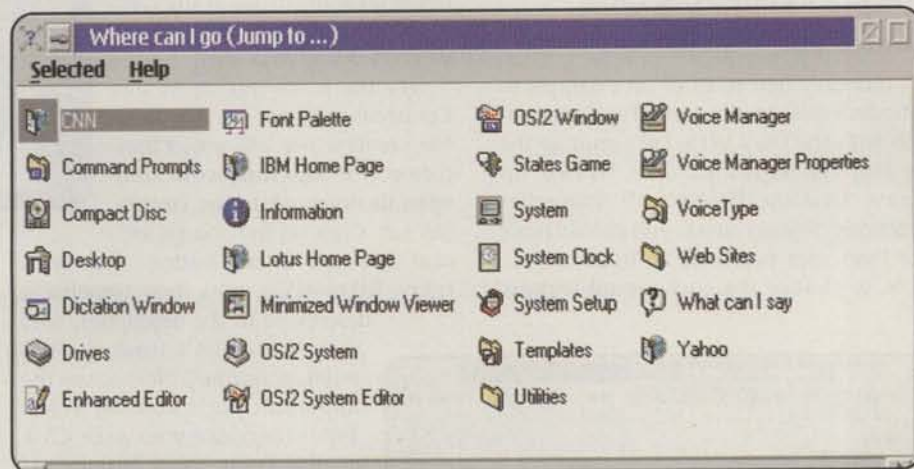
Getting it all up and running

If you don't have the VoiceType component of OS/2 installed, don't worry, it can now be installed using Selective Install. Once it's installed, using VoiceType is simple. Unless you have a distinctively strange accent, or speak with an impediment, you *should* be able to use VoiceType in its standard configuration — so let's get into it!

The first thing you have to do is enable the VoiceType Voice Manager before it will open programs for you. Open the Voice Manager (it's in the VoiceType folder under the Programs icon). The Voice Manager window is broken up into three areas: the audio-level indicator, the command history and the status line.

The audio-level indicator is very much like others that are provided with multimedia applications within OS/2 itself. It is a visual indication of the amount of sound that is falling on the microphone: the louder you speak, the higher the audio-level indicator, and vice versa. This indicator was included so users know that VoiceType's failure to operate is not caused by their accent, but by the absence of sound. The audio-level indicator should be in the yellow region when you are speaking — adjust your microphone or multimedia mixer panel to achieve this.

The command history is particularly



useful when troubleshooting, as all of your previous words are logged here in order of FIFO (first-in, first-out). If VoiceType doesn't understand a command, or hears some background noise, the words "Please Rephrase" will appear. This doesn't literally mean rephrase, just repeat yourself a little more clearly.

Finally, the status line is simply there to tell you what's going on, and in particular whether VoiceType is active.

Using the PM Shell

To start using the Voice Manager, click on the Microphone button to enable it. Test the level by saying a few words and adjusting the microphone's gain until the majority of your speech is in the yellow region.

A word of warning: do not over-enunciate words. If you speak extremely clearly and precisely now, VoiceType will not learn your real speech patterns, making future vocal input difficult. You'll end up pretty frustrated when it insists you use proper English, when you taught it so in the beginning!

Now, assuming you have the OS/2 Chess program installed, say the following (waiting for each command to complete before starting the next): 'Desktop, Open Programs, Open Games, Open Chess'. If all was successful, you should have the OS/2 chessboard staring at you, waiting for your first move — and all without the cumbersome ties of the humble mouse. An achievement indeed.

But it didn't work!

OK, if all didn't go to plan, there are a couple of things you can do. First, check the installation of VoiceType, and ensure your soundcard is happy with OS/2. If everything seems all right, you may need to *train* VoiceType — see the *VoiceType Guide* for more information on training.

Disabling VoiceType

You may need to turn VoiceType recognition off every now and then, for instance, when you need to talk on the phone, and you don't want your text editor to record your conversation. All you have to do is say, 'Go to sleep'. Then, to enable voice recognition again, just say 'Wake up please' — how polite!

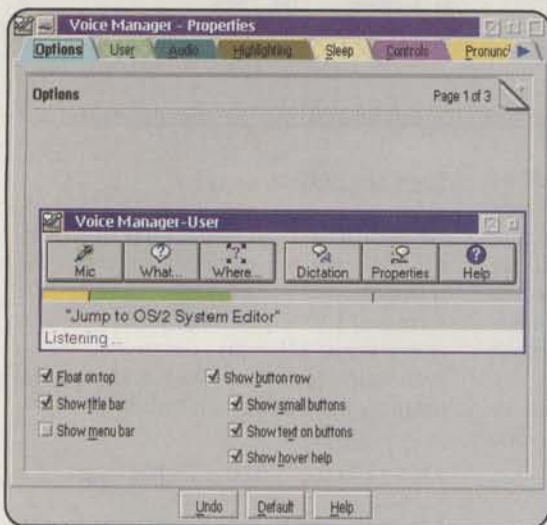
What can VoiceType control?

Certain WPS controls are not so obvious. If you want to know what VoiceType Voice Manager can control and do, open the Voice Manager, and click on 'What can I say?'. Generally, you can control almost everything on the screen that you can control with your pointing device, but not absolutely everything. If, in the displayed list, a command or function is crossed out, VoiceType needs your help — it needs you to define the pronunciation of that command. If a word isn't displayed, VoiceType won't be able to recognise it. If you want to add a word to the

list, no problem — create a macro and assign a word to it. One word of caution: use an associated word that you will remember and is appropriate, such as the title itself. Otherwise, you'll forget it, and become *really* frustrated.

Simple navigation with VoiceType

It's probably best to show an example to introduce you to the VoiceType integration with the OS/2 WPS. Let's change the desktop background. Say 'Wake up please, Desktop, Deselect all, Properties notebook'. Reality check: you should have the Properties notebook in front of you. Now, to change the background feature,



say 'Background, Normal, Image, Drop down.' Wow! You can even control drop-down menus. To navigate through a drop-down menu, simply say 'Up' or 'Down' until you're happy with your new desktop image. If you can't find an image you're happy with, you can discard your changes by saying 'Undo, Close'. On the other hand, if you like your new image, just say 'Close'. Oh, and to stop voice recognition, say 'Go to sleep' — that's the step I usually forget!

Jump to . . . navigation

One of the most useful functions of VoiceType is the ability to Jump to . . . — it's like pressing Alt-Tab without using your hands. To see the available Jump to . . . commands, click on the 'Where can I go?' command in the Voice Manager. You will find a list of programs and applications including the desktop, Drives folder, command prompts, your own macros, and the like. You can

also jump to URLs on the Internet using the Jump to . . . command — some URLs are already installed with OS/2 by default, so try saying 'Jump to IBM'. This should open your default Web browser and connect to IBM's home page in the US. If the IBM site is not really that useful to you, you can define your own.

Try the following: open the Connections folder on the desktop, create a new URL object that connects to **apcmag.com** and open its notebook to the Properties tab. Click on the Speech tab, and then the Create button. Type in a name (like 'APC'), and then something descriptive in the description field (like 'Australia's leading computer magazine'). Now comes the important part: training VoiceType to recognise your voice. Click on the Train Word button and then click on Record. Immediately say the word or phrase that you would like tied to the object (like 'APC'). Click on Stop to cease recording, and then add your new word to your personal vocabulary list. You can quite easily repeat this process to access any object on the desktop using voice commands. More information can be found in the VoiceType documentation — say 'Wake up please, Jump to Information, Open VoiceType guide'. See, it is useful!

What else can I do?

You can control menus and enter commands using your voice. A colleague of mine used to play Tetris quite convincingly using VoiceType. Menu names, items, push buttons, drop-down lists, you can activate them all using your voice. If you get stuck, and are not quite sure how to do something or go somewhere, remember you can always say 'Where can I go?' or 'What can I do?'.

Dictation: is it useful?

The answer is, it depends. If you are a typical user, you will find VoiceType's vocabulary quite extensive. To help cope with the demand of specialised words, IBM has also released add-on dictionary packs for areas such as medicine, the law and even journalism.

Try the following: say 'Wake up please, Jump to OS/2 System Editor, Begin dicta-



tion'. Then begin dictating, pausing briefly between each word. The VoiceType Quick Dictation window appears, and what you say is now recognised as text in the window. Please note that any system commands will not work now. For example, if you say 'Jump to desktop', the words 'Jump to desktop' will appear in the dictation window. To stop dictation — you guessed it! — just say 'Stop dictation'.

To close the Quick Dictation window, say 'Done' and the dictated text is inserted at the cursor point in the OS/2 System Editor. Don't forget to say 'Go to sleep' when you're finished, though!

Integrated tasks

More common menu commands are available using VoiceType, including cut, copy and paste. Let's face it, although VoiceType can be used to control almost anything in OS/2, it really shines in text dictation, so these shortcuts are very useful. For example, open the file that you just created and say the following: 'Wake up please, Home, Next word, Next word, Cut, Next word, Next word, Paste, Go to sleep'. Now let's change the font: 'Wake up please, Set font, Style, Bold, OK, Go to sleep'.

See, it's really not that difficult, it just takes a bit of getting used to. In fact, this article was written using OS/2's VoiceType. There were a couple of problem areas — APC manuscripts must include 'tags' which provide formatting instructions. For example, where you saw APC, I actually had to write '<I>APC</I>' by saying 'angle brackets'. This took me a little time to work out, but I got there in the end.

Overall, VoiceType is very useful for text dictation and WPS navigation. Don't expect it to completely replace your mouse, but it certainly is a very powerful tool, especially if you're still using that archaic keyboard. ■

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Installing Mac OS 8.5. By Stephen Withers

Mac OS

Mac OS 8.5 is the first PowerPC-only release of the Mac operating system. According to the box, you need a minimum 16M of physical RAM (24M virtual), but I wouldn't like to run it in less than 32M. As I write this, the system software on my machine occupies almost 32M alone. Admittedly, this includes over 3M of disk cache and a variety of non-core extensions, but I'm sure you get the idea. Since 32M of RAM and 8.5 cost about the same, buying some extra RAM isn't a bad idea. If you've got the necessary hardware, you'll almost certainly enjoy the new features and improved performance.

Installing OS 8.5 is generally straightforward but if you haven't taken the plunge, the following notes may help.

Stop and backup

It's always a good idea to do a full backup before installing a new operating system. Indeed, some people suggest doing *two* full backups to minimise the risk of being unable to return to your previous setup, but whether you take that advice will depend partly on how fast your backup hardware works. I strongly recommend you take the trouble to back up anything important; see APC December, page 156, for some hints about this.

If you've decided to switch to HFS+ (and that's not a bad idea as it's been around long enough for the wrinkles to emerge, and third-party disk utilities now support that format), you will almost certainly need to back up before reformatting the disk. You might not bother in some cases, for instance if you plan to use Alsoft's Plus-Maker utility instead of reformatting, or where you keep all your documents on removable storage and you have only a small number of programs and you're planning to reinstall them as well.

There have been some reports of people losing the entire contents of their hard disks after upgrading to Mac OS 8.5, though this seems to be an ongoing problem with the system software rather than something specific to OS 8.5. Similar reports surfaced after previous upgrades.

Data loss has apparently happened up to several days after the new OS has been installed, so be sure to keep your last pre-OS 8.5 full backup and be especially scrupulous with your backup routine during your first couple of weeks with Mac OS 8.5. Don't let this put you off OS 8.5 — the problem does seem to be rare, but it's wise to take precautions in case you are affected.

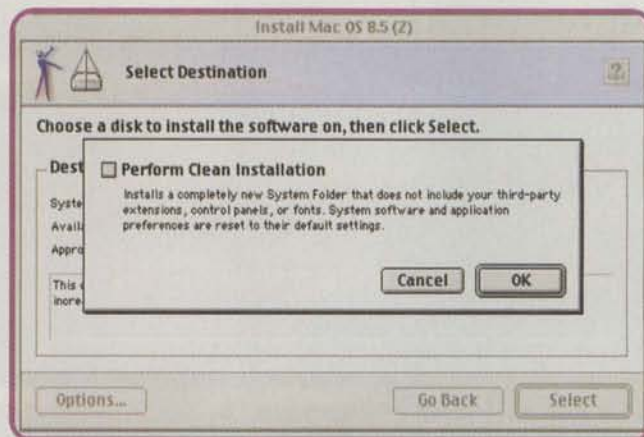
There have been suggestions that the problem is related to the disk driver, but it is certainly not as simple as that. The only first-hand information I can offer is that I reformatted my hard disk using the version of Drive Setup (1.6) on the Mac OS 8.5 CD and had no problems. For further reading on this subject, see MacFixIt (<http://www.macfixit.com/reports/macos8.5-c.shtml>).

Internet settings

One of the changes in Mac OS 8.5 is that the functions of the PPP control panel have been rolled into Remote Access. It's therefore a good idea to export the settings from PPP and import them into Remote Access after the upgrade. Do the same with the TCP/IP, Modem and AppleTalk control panels to save re-entering all the information either by hand or with the Internet Setup Assistant.

Keep it clean

If you didn't reformat the hard disk, you should still do a clean install of Mac OS 8.5. This creates a brand-new System Folder and ensures that no corrupted items are carried over from the existing system software. Such corruption isn't always immediately apparent, and it is arguably a weakness of Apple's Installer that it doesn't check the integrity of existing files. Anyway, a clean install is one of those jobs that takes a little longer, but often saves time in the long run.



Older versions of the Installer hid the clean install option behind a 'magic' key combination, but now all you have to do is click the Options button from the Select Destination window, and then check the Select Clean Installation box.

The drawback of a clean install is that it is exactly that — your new System Folder contains only those components you selected (either explicitly or by default) in the Installer. It does not carry over your preference files, any previously installed extensions, control panels, fonts or application support files.

You can manually copy or move items from the old System Folder to the new one, but it's tedious. Conflict Catcher 8 has the useful feature of being able to move items intelligently. By 'intelligently' I mean that it has some knowledge of what works with what, and, for example, refuses to move items it knows are incompatible with Mac OS 8.5. Note that you have to install Conflict Catcher 8 before you upgrade to OS 8.5 if you want to use this feature.

If you prefer to go the freeware or shareware route, utilities such as MOSH (Mac OS Installer Helper, freeware, <http://www.QuickTimeFAQ.org/software/mac/MOSH-1.5b2.bin>) are a big help.

A few items may need to be reinstalled rather than moved. One example is Master Juggler. This situation generally arises when a piece of software adds resources to a file in the System Folder such as the System file itself.

Associated updates

While most applications seem to be compatible with Mac OS 8.5, you may see a few cosmetic glitches, such as menus with white instead of platinum backgrounds, which can often be fixed with an updater (for example, Microsoft Office 98, <http://www.microsoft.com/macoffice/users/issues.htm#os8.5>) or with Mercutio Patcher (\$US15 shareware, <http://w1.317.telia.com/~u31705058/dev/download/mercutioPPC.sit.hqx>; fixes dozens of programs including Photoshop and EMailer).

Utilities are in more intimate contact with the operating system and therefore more sensitive to changes. Some examples appeared in last month's Shareware column (see **apcmag.cd** January 1999), but it's a good idea to check the developers' Web sites. A useful shortcut is to do a full-text search of a site such as download.com for occurrences of '8.5'.

We're also seeing the emergence of OS 8.5-specific utilities. Again, some were mentioned in January's Shareware, and one of my favourites is Prestissimo. This control panel gives convenient access to settings for the new Keyboard Switching, Application Palette and Smart Scroll features. I especially appreciate its ability to put double scrolling arrows at each end of the scroll bar, as I find the focus of activity tends to be at the top of the window with some applications, and at the bottom with others.

CD Extras

As with previous releases, you should take the time to check the contents of the CD Extras folder on the Mac OS 8.5 CD-ROM.

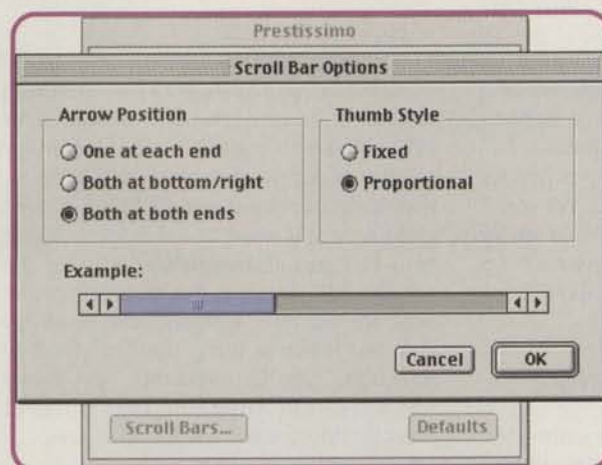
There are pleasant collections of desktop pictures and patterns, the now-traditional Eric's Solitaire Sampler, and a modest selection of updates for Apple and third-party software. There's also some more interesting stuff.

If your audio CD collection includes discs with 'CD Extra' multimedia content, install the AppleCD Player in place of the default AppleCD Audio Player.

AppleScript received some major improvements in Mac OS 8.5. Apart from the improved performance due to native code, the scriptability of various system components has been improved, and some new features added. In particular, you can associate scripts with folder actions such as adding a file or closing a folder. If you're interested in the topic, use the new Help Center (under the Finder's Help menu) to look up 'folder

actions'. This will prevent you from wasting time as I did before I read that folder action scripts will only run from a local fixed disk. This is a security measure to reduce the risk of inadvertently activating a hostile script. Also note that folder actions are triggered by activities that change the display, so a script to handle a file being added to the folder will only run if the folder is open (either in icon or list view).

Search through the CD Extras folder hierarchy and you'll find a sample AppleScript called 'summarize added text files'. This is a very neat demo of Mac OS technologies. Attach this script to a



folder on your hard disk (Command-click on the folder, choose Attach a Folder Action, and select the script), then add a text file to the open folder. The script uses the Summarizer to précis the document in three sentences, then reads the summary aloud. Cool stuff — how about writing a script that does something similar with your email?

Within the Network Extras folder, you'll find an implementation of SNMP for the Mac. This is only useful if there's an SNMP console running somewhere on your network, but it allows remote monitoring of Mac OS and the TCP/IP and AppleTalk stacks. If you do want to use it, you'll first need to run the main installer again, select Add/Remove (software) and choose a custom install of Mac OS, selecting only SNMP within the Networking and Communications group. Once that's done, follow the instructions in OT/SNMP Readme (in the SNMP Admin subfolder of the CD-ROM).

For an unknown reason, the International version of OS 8.5 doesn't include the sample QuickTime files mentioned in the About CD Extras document.

Post-OS 8.5 updates

Nothing in computing stands still for long. At the time of writing, Apple had released a new version of Apple System Profiler (2.1.2, recommended for all PowerPC-based Macs), Drive Setup (1.6.1 — specifically to correct problems with the PowerBook 2300 and 5300, but apparently recommended for all Macs running Mac OS 7.6 or later), and Power Macintosh G3 CD Update 1.0 (fixes the 'slow wakeup' problem occurring with certain G3 models and CD-ROM drives). There will probably be more by the time you read this.

Sherlock

No discussion of Mac OS 8.5 would be complete without mentioning Sherlock. Even if you only use it as a replacement for Find File, you'll appreciate the extra speed when searching for a file or folder by name. The results appear almost instantaneously, even on a volume containing 10,000 items. If you search by content, Sherlock's ability to index the text on your drives is a major timesaver, though you do need to give it time to build and maintain those indexes. But Apple thought of that, and you can schedule indexing for times when your Mac would otherwise be idle. Incidentally, the index files can easily occupy several megabytes.

Most attention was given to its Internet searching capabilities. Sherlock uses a series of plug-ins to communicate with various Web-based search engines. This means you can look in many places in one go, but you can also tune your search by selecting in Sherlock's window a subset of engines that you consider appropriate.

This is especially relevant when you realise that many special-purpose sites provide Sherlock plug-ins for their own search facilities. Although Mac OS 8.5 comes with just a few plug-ins, many more are now available from diverse sources. Once again, download.com is a good place to look.

Sherlock is designed to automatically check for and, if necessary, download new versions of plug-ins, so once you've got the plug-ins for your favourite sites, you don't need to keep them up-to-date manually.

Next month, we'll look at writing Sherlock plug-ins.■

Using PHP and databases to create dynamic Web sites.

By Geoffrey Bennett

Linux

History

PHP is a server-side Web scripting language which allows Web developers to quickly and easily produce pages with dynamic content. Rasmus Lerdorf wrote the original version of PHP (Personal Home Page tools) in 1994, to see who was reading his online résumé. Other people took note and asked to use it. They then requested additional features, and eventually Lerdorf made a public distribution.

Version 2, PHP/FI, was released in 1995, and included the functionality of a Form Interpreter, which made it easy to interface Web pages with databases.

PHP was completely rewritten by its developer team in 1997/98, and Version 3 was announced on June 6, 1998. From its humble beginnings, PHP has come a long way and the acronym now stands for 'Professional Home Page'.

Features and capabilities

PHP is an interpreted language embedded within an HTML document. For example, if you put the following line in a PHP-enabled Web page, the number '3' would be displayed:

```
<? $a = 1 + 2; print $a; ?>
```

PHP's syntax is mostly based on C and Perl: the grammar is similar to C; the string and memory handling are similar to Perl. There are also some object-oriented features.

Database connectivity is probably PHP's strongest point. Version 3 supports at least 13 different database products, including ODBC.

PHP can be used either as a CGI wrapper program, or embedded in the Web server itself. Using the server-embedded version is preferable for performance reasons, because a separate process does not need to be launched for each PHP Web page request. Persistent database connectivity (also good for performance) is also available when using the server-embedded version.

PHP is most commonly used in conjunction with the Apache Web server; this article assumes that you'll be using Apache with the server-embedded version of PHP.

Getting started

PHP source or binaries can be downloaded from <http://www.php.net/>, but if your distribution vendor provides PHP packages (at least Red Hat and Debian do), that would be an easier way to start.

Once you have PHP installed, create a file in your Web space called `test.php3`, and place the following line in it:

```
<? phpinfo() ?>
```

Open `test.php3` with your favourite Web browser. If Apache has been configured for PHP, you'll get a page with all sorts of information about your Apache/PHP installation. If all you see is the above line displayed literally, you'll need to tell Apache about your PHP installation. If you're using the Debian PHP package, the following procedure should have already been done for you, but if you're using the Red Hat PHP package, you'll need to edit your `/etc/httpd/conf/httpd.conf` and `srm.conf` files and uncomment the following lines:

```
LoadModule php3_module modules/libphp3
.so
AddModule mod_php3.c
AddType application/x-httpd-php3 .php3
```

PHP Basics

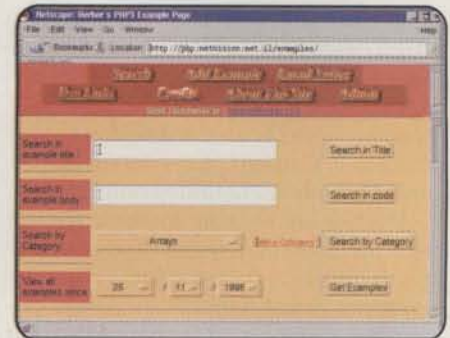
As mentioned above, PHP is an *embedded* scripting language. This means that you can create a Web page in the usual way, but you can also write scripts inside the Web page that will be executed by the server before the page is sent to the client. Apache can tell the difference between a regular Web page and a PHP-enabled Web page by the extension.

For example, create a Web page with a PHP3 extension and place the following paragraph in it:

```
<P>You appear to be running a "<? print
$HTTP_USER_AGENT; ?>" web
browser.</P>
```

On my computer, this shows up as:

You appear to be running a "Mozilla/4.07 [en] (X11; I; Linux 2.0.36 i586; Nav)" web browser.



Note the following points about the PHP script above:

- '<?' and '?>' are used to begin and end code that is to be run by the PHP interpreter instead of sent to the browser;
- `print` is a PHP statement that outputs some text to the browser;
- `$HTTP_USER_AGENT` refers to a variable sent from the browser to the Web server, and then made available to PHP;
- a semicolon is used to end a PHP statement.

PHP supports the features that you'd usually expect to find in a programming language, such as conditional statements, loops, and functions or procedures. Here's an example that creates a Web page with numbers from one through 10, with asterisks by numbers exactly divisible by three:

```
<?
$a = 1;
while ($a <= 10) {
    print "$a";
    if ($a % 3 == 0) {
        print "<BR>";
    } else {
        print "<BR>";
    }
    $a = $a + 1;
}
?>
```

Note that in the script above:

- variables don't need to be declared before they can be used, and they always have a leading \$ sign;
- you assign to variables using `=`, but `==` is used to do comparisons;
- `%` is the modulo operator — it returns the remainder after dividing one number by the other.

PHP and forms

PHP makes it very easy to use Web forms to input and process data. Any data from a form sent to a PHP script is immediately available for use through PHP variables. If you had the following form on a Web page:

```
<FORM ACTION="testform.php3"
METHOD="POST">
Please enter your name: <INPUT TYPE=TEXT
NAME=yourname>
<INPUT TYPE="SUBMIT" VALUE="Done">
</FORM>
```

and you had the following code in testform.php3:

```
<?
if ($yourname) {
    print "Hello $yourname!";
} else {
    print "You didn't enter anything!";
}
?>
```

when the user typed their name, they would receive a personalised greeting.

Sending email

PHP has a mail statement, which allows you to send an email from a PHP script to a given email address with a particular subject and message. If, in the above greeting example, you inserted the following statement just below the greeting print statement, then Webmaster@yourdomain.com.au would be informed of any greetings that were made:

```
mail("Webmaster@yourdomain.com.au",
"Greeting sent", "A greeting was sent to
$yourname.");
```

Of course, the above example could easily be expanded to multiple fields, and you could have an instant customer feedback form, or a simple online ordering system. You could also combine the feedback form and the response script and add a test so that if the user doesn't enter the required data, the form is redisplayed.

PHP and databases

The most popular databases used with Linux are currently PostgreSQL, MySQL and MSQL. PHP supports the use of all three, but we'll just demonstrate the use of PostgreSQL to create a simple guestbook here. Once you've got it up and running, you'll need to create a database that can be used by PHP,

but first you'll need to tell PostgreSQL who is allowed to create and access databases.

To do this, log in as the postgres user (you can use su - postgres as root to do this) and type createuser you (where 'you' is the login name you usually use). Accept the default user ID, answer 'y' to the question about whether you are allowed to create databases, and 'y' to the question about whether you are allowed to create users.

After granting your user account access to PostgreSQL, you need to allow Apache user access as well. Apache usually runs as user 'nobody', but you can double-check this by looking in the httpd.conf file (usually stored in /etc/httpd/conf or /etc/apache) for the 'User' line. When you run createuser nobody (or the actual username), accept the default user ID again, and answer 'n' to both questions.

Now log out of the postgres account back into your regular user account and type createdb visitor followed by psql visitor. This creates a database called visitor, then starts the interactive SQL interface and connects you to that database. You can now enter SQL commands and have them executed immediately. To create a table to store information entered by users, type:

```
CREATE TABLE guest_entry (
    name VARCHAR(40),
    message TEXT
);
```

If you are not familiar with SQL, it may be worth reading up on PostgreSQL and Structured Query Language (SQL).

You now need to assign 'select' and 'insert' rights to the Web user so that they can access this table:

```
REVOKE ALL ON guest_entry FROM nobody;
GRANT SELECT,INSERT ON guest_entry TO
nobody;
```

(As before, use the real Web user name if it is different to 'nobody').

Now that we have set up a database, you can try inserting some data into it:

```
INSERT INTO guest_entry VALUES ('Bob',
'Test message');
```

Now try retrieving the data:

```
SELECT * FROM guest_entry;
```

If all goes well, we can try accessing the data from PHP. Place the following in a

PHP-enabled Web page:

```
<?
$database = pg_Connect("", "", "", "", "vis-
itor");
$result = pg_Exec($database, "SELECT *
FROM guest_entry");
$num_rows = pg_NumRows($result);
for ($row = 0; $row < $num_rows; $row++)
{
    $row_data = pg_fetch_array($result, $row);
    print "<B>" . $row_data["name"] . "</B>";
    print $row_data["message"] . "<P>";
}
?>
```

The pg_Connect, pg_Exec and pg_NumRows functions connect to a PostgreSQL database, execute a query, and find out the number of rows the query returned. If you're familiar with C or Perl, the for statement will be familiar. The only other new concept here is \$row_data["name"] — this is an 'associative array', which lets you store many values in one variable.

If you get an error about an unsupported or undefined function 'pg_Connect', it is most likely that PHP was not compiled with PostgreSQL support, and you'll need to recompile it with the —with-pgsql configure flag. Alternatively, it may be that you just need to install the PHP PostgreSQL

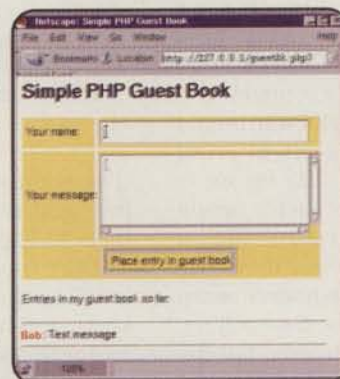
module package (for instance, php3-pgsql if you are using Debian).

If you get a 'Query Failed' and 'Permission Denied' error, check that you've performed the revoke/grant so the Web user has access to the guest_entry table.

On this month's **apcmag.cd** you'll find a PHP Web page that incorporates everything we've discussed so far.

References

PHP: <http://www.php.net/>
Apache: <http://www.apache.org/>
NCSA Beginner's Guide to HTML: <http://www.ncsa.uiuc.edu/General/Internet/WWW/HTMLPrimer.html>
HTML forms: <http://www.uwa.edu.au/cwis/howto/forms.html>
PostgreSQL database: <http://www.postgresql.org/>
SQL Tutorial: <http://w3.one.net/~jhoffman/sqltut.htm> ■



The lighter side of programming.

By Michael Smith

Developers Corner

This month's column will be the last Developers Corner for a while. Beginning in March, I'll be presenting a series of tutorials on C++ programming. For the last Developers Corner, I've decided to cover a slightly lighter topic: *The noble art of hacking*.

In recent times, the term 'hacking' has largely fallen into disrepute. This has largely been caused by the mainstream media's continued misuse of the term. The word 'hacker' typically conjures up a vision of an electronic vandal who breaks into computers with the intention of damaging or stealing. This vision is wrong. The correct term for such a person is 'cracker'. The two words sound similar and somewhere along the way they have become confused. The term hacker, when used correctly, is much less disparaging. A cracker may also be a hacker, but the two are not synonymous.

The term 'hack' was originally used in computing circles to describe a quick and dirty (but often ingenious) solution. It has come, over time, to mean solving a problem by coercing a piece of software or hardware to act in a way that its designer never intended. The *New Hacker's Dictionary* (see sidebar) gives a number of definitions for the term 'hacker'. I think that the best definition is: "One who enjoys the intellectual challenge of creatively overcoming or circumventing limitations."

A hacked solution may involve a fiendish piece of C code, enhancing your software with a binary editor or upgrading your computer with alligator clips and gaffer tape. It may simply involve an innovative use of an existing tool. It will almost certainly involve your colleagues shaking their heads knowingly as you try it, and with disbelief when (and if) it works.

The following are examples of classic hacks.

The Duffs Device

Tom Duff, while working at Lucasfilm, had a subroutine to send data to a serial port. The code looked something like this:

```
void send( register short *to,
          register short *from,
          register short count )
{
    do
        *to = *from++;
        while(--count){}0;
}
```

(I've changed the function declaration here and in the next segment to make them ANSI-compliant).

Duff tried to speed up the code by unrolling the loop, and he came up with a staggering hack to manage the unrolled loop with a switch statement:

```
void send( register short *to,
          register short *from,
          register short count )
{
    register int n = (count + 7) / 8; /* count
    > 0 assumed */

    switch (count % 8)
    {
        case 0: do { *to = *from++;
        case 7:  *to = *from++;
        case 6:  *to = *from++;
        case 5:  *to = *from++;
        case 4:  *to = *from++;
        case 3:  *to = *from++;
        case 2:  *to = *from++;
        case 1:  *to = *from++;
                } while (--n > 0);
    }
```

The function now loops only one-eighth as many times. Given that looping takes several machine cycles, this may

speed up the execution significantly.

The scary thing is, this is perfectly legal C and C++. Duff says that Dennis Ritchie (the creator of C) confirmed its legality. Bjarne Stroustrup, creator of C++, used a slightly modified version as an example in his book *The C++ Programming Language*.

This hack has been best summarised in Duff's own words: "Many people have said that the worst feature of C is that switches don't break automatically before each case label. This code forms some sort of argument in that debate, but I'm not sure whether it's for or against."

Robin Hood and Friar Tuck

This sounds a lot like an urban legend, but the Net old-timers swear it's true. Being a romantic at heart, I'm inclined to believe them.

In the 1970s, staff at Motorola discovered a security hole which allowed unauthorised users to have unlimited access privileges on the Xerox CP-V timesharing system. Motorola filed a 'Level One SDR' bug report, which meant 'This needs to be fixed by yesterday!' Xerox was somewhat slow in responding and, a few months later, no fix had been produced.

Finally, Motorola staff decided to take direct action.

One day Xerox's main CP-V software development system in El Segundo started behaving curiously. Tape drives started rewinding and dismounting in the middle of jobs; hard drives started seeking back and forth so quickly that they began walking across the floor; the card punch output device began producing occasional 'lace' cards; and the system console started printing snide and insulting remarks from Robin Hood to Friar Tuck, and vice versa.

The system's programmers found two 'ghost jobs' (hidden processes) running,

one called 'Robin Hood' and the other 'Friar Tuck'. When they tried to kill off the jobs, the following happened:

```
!X id1
```

```
id1: Friar Tuck... I am under attack! Pray
save me!
```

```
id1: Off (aborted)
```

```
id2: Fear not, friend Robin! I shall rout the
Sheriff of Nottingham's men!
```

```
id1: Thank you, my good fellow!
```

Each ghost job would detect that the other had been killed off and restart it within milliseconds. The only way out was to kill both jobs simultaneously or to deliberately crash the system. Finally the system's programmers opted for the latter option. However, when they restarted the system they found that the boot image had been patched, so that Robin Hood and Friar Tuck were restarted. It was not unlike the way MS-DOS viruses operate, but it was some years before viruses were invented.

Finally, the Xerox system programmers had to reinstall the OS from a clean tape. By a strange coincidence, Xerox released a patch for the security hole shortly after that.

The International Obfuscated C Code Contest (IOCCC)

If ever there was a pastime for hackers, the IOCCC is certainly it. It was created in 1984 by Landon Curt Noll and Larry Bassel (Noll is still a judge of the contest). The idea is to write short C programs in such a manner that the casual observer will have no idea what the program does. Some people might suggest that this is not all that hard to do, many programmers may even do it by accident. However, in this case the casual observers tend to be some of the world's best C programmers — and they are a little harder to confuse.

The goals of the contest, as outlined on the IOCCC Web page (<http://www.ioccc.org/>), are as follows:

- To write the most obscure/obfuscated C program under the rules below.
- To show the importance of programming style, in an ironic way.
- To stress C compilers with unusual code.
- To illustrate some of the subtleties of the C language.
- To provide a safe forum for poor C code.

This program, which was submitted anonymously, received a 'dishonourable mention' in the inaugural contest (1984).

IOCCC source example 1

```
int i;main(){for(;i["[[[;]]]]{—i;"};read('-'-
',i++++"hello,world!\n",'/'/'))read(j,i,p){writ
e(j/p+p,i—j,i/i);}
```

It should be printed all on one line, but the magazine's columns aren't wide enough. Any idea what it does? I'll put the answer at the bottom, but try to figure it out before you look.

The second example is my personal favourite. I defy anybody to figure out what it does simply by examining the code. I've reformatted this slightly to make it fit in the column, but I haven't made it any harder to read.

IOCCC source example 2

```
main(t,_,a ) char * a ; {
return!
0<t?t<3?main(-79,-13,a+
main(-87,1-_,main(-86,0,a+1 )
+a)):1,t<_?main( t+1,_, a )
:3,main ( -94, -27+t, a )
&&t == 2 ? _<13 ?
main ( 2, _+1, "%s %d %d\n" )
:9:16:t<0?t<-72?main( _, t,
"@n'+,#/*{w+/w#cdnr/+,/r/*"
"de)+,/*{+/w[%+,/w#q#n+,#{"
"l,+/n[+/,+##n+,#;#q#n+/,+k"
"#;*,+/r :d*3,){w+K w'K:'+"
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"+,)##*'}#nc,'#nw'/'/+kd'+e+"
";#rdq#w! nr/' ) }+){rl#'{n"
"" ' )# ' }+ )#(!!/"
:t<-50?_==*a ?putchar(31[a]):
main(-65,_,a+1):
main(("a == '/') + t, _, a + 1 )
:0<t?main ( 2, 2, "%s" )
:*a==/'llmain(0,
main(-61,*a, "lek;dc i@bK'(q)-"
"[w]*%n+r3#l,():nuwloca-0;m ."
"vpbks,fxntdCeghry"),a+1);}
```

Give up? It writes out the words of 'The 12 Days of Christmas'. If you don't believe me (and I don't blame you) try running the version on **apcmag.cd** (file names IOCCC2.C and IOCCC2.EXE).

This last curious program will happily compile and run using a C compiler or a Fortran compiler. It will also run as a shell script under the Unix Bourne shell.

IOCCC source example 3

```
cat =13 /*/ >/dev/null 2>&1; echo "Hello,
world!"; exit
```

```
* This program works under cc, f77, and
/bin/sh.
```

```
*
*/; main() {
write(
cat---cat
/*,(
"/
,"Hello, world!"
,
cat); putchar(-----cat); } /*
,')
end
*/
```

In case you were wondering, the first example prints 'Hello World'. Keep on hacking! ■

The New Hacker's Dictionary

The *New Hacker's Dictionary* started out life as the Jargon File, a list of computer and Internet jargon. The dictionary is still available on the Net at http://www.tuxedo.org/~esr/jargon/jargon_toc.html and in various other places if you search for it.

The list's compiler, Eric Raymond, first published the *New Hacker's Dictionary* in 1991. The third edition, published in November 1996, is still available from good bookstores (MIT Press; ISBN 0262680920).

Raymond claims the *New Hacker's Dictionary* is used by the *Oxford English Dictionary* as "a major source for computing neologisms". Refer to your *Oxford* if you don't know what a 'neologism' is.

I have found it to be a valuable reference, and much of the material in this article was either sourced or verified from *The New Hacker's Dictionary*.

A look at basic Java syntax.

By Travis Simon

Java

So far in the Java series, we have sung the praises of the language and taken a high-level look at object-oriented programming. This month, we're going to take a more detailed look at the specifics of Java syntax, and hopefully encourage you to create your own Java code. Once again, little emphasis will be placed on explaining these concepts — they are pretty rudimentary to any programming language. If you have no programming experience at all, you can find out more information by reading through the first couple of chapters of my online JavaScript column at <http://apcmag.com/JavaScript/>.

Whitespaces

In Java, whitespaces (tabs, spaces and new lines) do not affect the compilation of your programs. Therefore, you should use whitespace to make your code more readable (but you already know this, right?). You can use any style of formatting you like for your code, as long as you realise that my formatting is better than any other style. Really. I promise.

Java statements

Java statements must end with a semicolon.

Variable declarations

Variables must be declared before they can be used. Unlike JavaScript, Java is a strongly typed language, which means that a variable can only hold one specific type of value. For example, Boolean variables can only hold true and false values, and numeric variables can only hold numeric data. The whole system is not as inflexible as it sounds, though, and we'll learn later how to convert data from one type to another.

Variables in Java can be integers (numbers), floating point numbers (numbers with decimal places), chars (alphanumeric characters) and Boolean (true/false — C programmers should note that you cannot use numeric values for true and false in Java). There are several different versions of the numeric classes, however.

The following table illustrates the differences between Java's numeric primitives:

Java's numeric data types		
Type	Size	Range
byte	8 bits	-128 to 127
short	16 bits	-32,768 to 32,767
int	32 bits	-2,147,483,648 to 2,147,483,647
long	64 bits	9,223,372,036,854,775,808 to 9,223,372,036,854,775,807

Likewise, there are two different floating point primitives: floats, which are 32-bit single-precision values, and doubles, which are 64-bit double precision values. As it is unlikely that you will be doing many scientific calculations based upon knowledge gained from this article, it's probably safe to think of floats as really big numbers and doubles as really, really big numbers. C and C++ programmers should also note that Java's variable sizes are not platform dependent: an int is an int is an int. Further, there are no unsigned data types in Java.

You may be wondering why there are different size variables to store numeric values. The simplest answer is efficiency. Imagine that we were writing a program to track the editorial content of APC, and we wanted a variable to hold the number of words in an article. The simplest method would be to declare that variable as a long to make sure that we don't run out of storage space.

The problem with that approach is it is fairly unlikely that we'll ever see an article with a word count over 2 million words, much less 32,000. For every article that we store in memory, we've wasted at least 48 bits of information. Given the number of articles that APC produces, coupled with the fact that with such sloppy programming there's likely to be much more wasted memory, those 48+ bits can add up really fast.

You should also be aware of the concept of variable overflow. If you assign the variable a value larger than the vari-

able type can hold, the value will be truncated to fit within the range of the data type.

The syntax used to declare variables is fairly simple. To declare a variable, specify the data type and give the variable a name (the naming rules are similar to C). Alternatively, you can initialise variables when they are declared, and you can also declare several variables of the same data type in one command by separating them with a comma. For example, the following are all legal variable declarations:

```
int total;
float interest, rateOfChange;
boolean variable_initialised = true;
```

Finally, you can declare a variable to an object type the same way you declare a primitive. However, before using the object, it must be instantiated. The exception to this rule is the String class, which is automatically instantiated when it is created. For example, you can declare and initialise a String object using the following syntax:

```
String myString = "This is a string.";
```

Comments

Java supports C++ style comments, where statements surrounded by the /* and */ character combination are considered comments (and can optionally span multiple lines). Also, like C++, two forward slashes are considered to be single line comments, and any characters following the two slashes on the same line are ignored. For example:

```
/* This is a comment
   It can span multiple lines */
```

```
i=3; //<This is ignored>
```

Character escape codes

Java also supports character escape codes that should be familiar to most C programmers.

The following table lists Java's escape character codes:

Escape characters

Escape character	Meaning
\n	New line
\t	Tab
\\	Backslash
\'	Single quote
\"	Double quote
\b	Backspace
\r	Carriage return
\f	Form feed
\###	Octal encoded number
\x#	Hexadecimal number
\u####	Unicode character

Arithmetic and logic operators

There really aren't any big surprises in the way that Java handles arithmetic. It supports +, -, %, and 'etc' as they are in C/JavaScript. Programmers with previous experience only in JavaScript should be aware of the notion of variable promotion. Imagine a case where you want to add a floating point number (1.5) and an integer (3). What should the result be? It seems fairly obvious that the answer is 4.5, and in fact it is. However, you must remember that the data type returned is a float. If the operation returned an int, the result would be 5 instead of 4.5 — not what we're after. Keep that in mind as you perform arithmetic in Java.

The table at right lists operator precedence in Java. The operators should be familiar enough to figure out what is and isn't supported in Java. If you don't understand a particular operator, don't worry, it will probably be covered later.

String 'arithmetic'

Finally, as in JavaScript, Java supports using the plus sign (+) in conjunction with String objects for concatenation. For example, the following statement:

```
System.out.println("Hello there " + name);
```

would print out 'Hello there ' followed by the contents of the name variable.

Writing to the console

There are two methods most commonly used to print text to the console: the println() method and the print() method. For the moment, the exact syntax is not important, but generally the syntax looks like this:

```
System.out.print([n]([arguments]));
```

Putting it all together

This last example will put together all of the concepts presented here in this article. It's often easier to see Java syntax than have it laboriously explained. So, without further ado, here's Op.java:

```
class OpExample {
    static public void main(String args[]) {
        /*
         * Create and initialise some variables
         * BTW, this is a comment.
         */
        int anInt=5;
        float aFloat=2.5f;
        String myString="This is a string";
        boolean myBool=true;

        // display variable values

        System.out.println("");
        System.out.println("Expression\t\tValue");
        System.out.println("\n-----\t\t-----");
        System.out.println("anInt:\t\t\t" + anInt);
        System.out.println("aFloat:\t\t\t" + aFloat);
        System.out.println("myString:\t\t" + myString);
        System.out.println("myBool:\t\t\t" +
```

```
myBool);
```

```
System.out.println("");
```

```
if(myBool) {
    System.out.println("anInt + aFloat:\t\t" +
        (anInt + aFloat));
}
```

```
System.out.println("anInt += 2:\t\t" +
    (anInt +=2));
```

```
System.out.println("");
System.out.println("anInt is " +
    (anInt>aFloat ? "greater" : "not greater") + "
    than aFloat");
}
```

Type in the code and save it to a file called OpExample.java. Compile and execute the code (remember, the syntax to execute the class file is java OpExample).

The only section of this code that might seem unfamiliar is the declaration of the float: the 'f' in the expression float aFloat=2.5f; signifies that the numeric value (2.5) should be considered a float. Likewise, you could assign the number five to be a floating point value by using the syntax: float newFloat=1f;

There is a section that might be confusing to you if your only programming experience has been my JavaScript column. The last line (excluding the braces) uses the ternary operator to perform a conditional if . . . then . . . else . . . construct. Although this was covered in the tutorial, very little emphasis was placed on the construct. The syntax is:

```
<conditional> ? <True statement> : <False statement>;
```

With the ternary operator, 'True statement' is only evaluated when the conditional evaluates to true. If the statement is not true, 'False statement' is evaluated. It's just a shorthand notation that lazy programmers like me sometimes use.

If you are serious about learning Java, take this code and expand it to do anything your imagination is capable of producing. Remember that programming is not a spectator sport — the only way to learn how to program is to actually write programs. And, if you have any questions or problems, please feel free to email me on trav@acp.com.au.

Next month we'll start looking at looping statements in Java.

Operator Precedence

Operator	Description
. [] ()	Parentheses and brackets for grouping, and the dot operator.
! ++ --	The increment operators and the negation operator
new()	The new() keyword, used for instantiating objects
* / %	The multiplication, division and modulus operators
+ -	The addition and subtraction operators
<< >> >>>	Bitwise shift operators
<< <<< >> >>>	Relational operators
= !=	Equality operators
&	Bitwise AND
^	Bitwise XOR
	Bitwise OR
&&	Logical AND
	Logical OR
?:	Ternary if operator
= += -= *= /= % =	Assignment operators
&= = <<= >>= >>>=	Bitwise assignment operators

Each month this page lists all the Shareware files that can be found on apcmag.cd.
Simply browse to the Workshop section to find the files and related reviews.

Shareware summary

Windows 95

Clickomania 3.0

A simple but addictive game, which resembles a static version of Tetris.

Excalibur for Windows 1.05

A high-powered programmable RPN calculator, incorporating lots of useful business and scientific functions.

Arachnophilia 3.9

A powerful toolbar-based HTML editor that has many advanced features.

Reptile 1.4

An unusual tool to generate complex tiled textures; very useful for Web page backgrounds.

MINOS 2.2

This powerful 3D solid CAD program is capable of producing complex designs.

QuickPhrase 1.1

TypingMaster's handy utility to retrieve up to 10 pieces of frequently-used text for instant insertion into applications.

OS/2

Desktop Wizard 1.41

Desktop Wizard adds extra functionality to the OS/2 Workplace Shell and makes a few things easier to do. It adds bits and pieces to right-click menus, properties notebooks, and more.

DragText 2.5

DragText is a utility that... well, drags text. Using it you can add drag-and-drop features to entry fields, list boxes, combo boxes, static text fields, and more.

NPS WPS Enhancer 1.82

With NPS WPS Enhancer installed on your desktop, you have access to a number of extended functions — you can minimally adjust the desktop folder, show the Window List by clicking both mouse buttons simultaneously, and re-map keys in PM windows or OS/2 command windows.



Program Commander/2

Remember the LaunchPad, a familiar presence on the desktop in earlier versions of OS/2? Program Commander/2 (PC/2) is rather like the old LaunchPad with one major difference — it doesn't need the OS/2 WPS to run! You can use the Program Launcher as a WPS enhancement or replacement.

X-File

X-File is easily one of the most useful and well written OS/2 WPS utilities available. It is often described as the OS/2 "Open File Dialog Fixer". For example, the almost useless File Open/Save dialog box is enhanced with Drive buttons at the top — just one mouseclick, and you're in the new drive.



Mac OS

BBEdit Lite 4.1

One of the most capable text editors for the Mac. Its most unusual feature is regular expression matching (grep), which

allows complex search and replace actions.

Synchronize 3.6.4

An indispensable tool for road-warriors who need to regularly synchronise folders on two Macs. It has some quite sophisticated controls that can be applied to what is copied or replaced and what isn't.

SoundApp 2.5.1

If you can manage with only one sound utility, this is probably it. SoundApp plays and converts almost every sound format you've ever heard of, and can also work with play lists.

FinderPop 1.7.5

This is a free, premier enhancement for Mac OS 8.x. FinderPop makes the contextual menu system a potent Finder management tool, with a range of functions that are both useful and highly configurable.

NetCD 1.5 PPC

Forget typing in all the track lists from your music CDs. NetCD consults an Internet database when you insert a CD,

and presents album and track titles along with other information such as lyrics.

ResEdit 2.1.3

Once the darling of Mac hobbyists, this powerful tool has retreated from the public gaze. Apple's own resource editor can provide interesting insights into Mac software, and be a lot of fun in the process.

Linux

Tomsrtdt

This is a Linux distribution contained on a single floppy, and is intended to be used as a system repair tool. Tomsrtdt comes with a good range of system and network tools.

GtkSamba

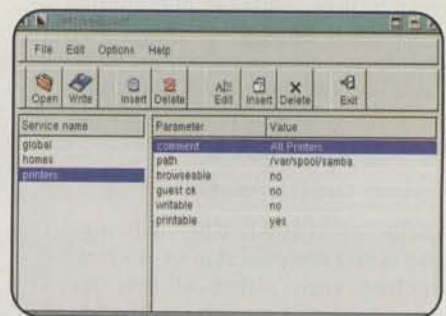
GtkSamba is a GUI front end to Samba configuration. It is currently in early development, but looks promising as a system management tool.

Rsync

Rsync is a highly efficient file and directory-mirroring tool that can be used to replace the traditional Unix rcp. It offers significantly extended functionality.

XdaliClock

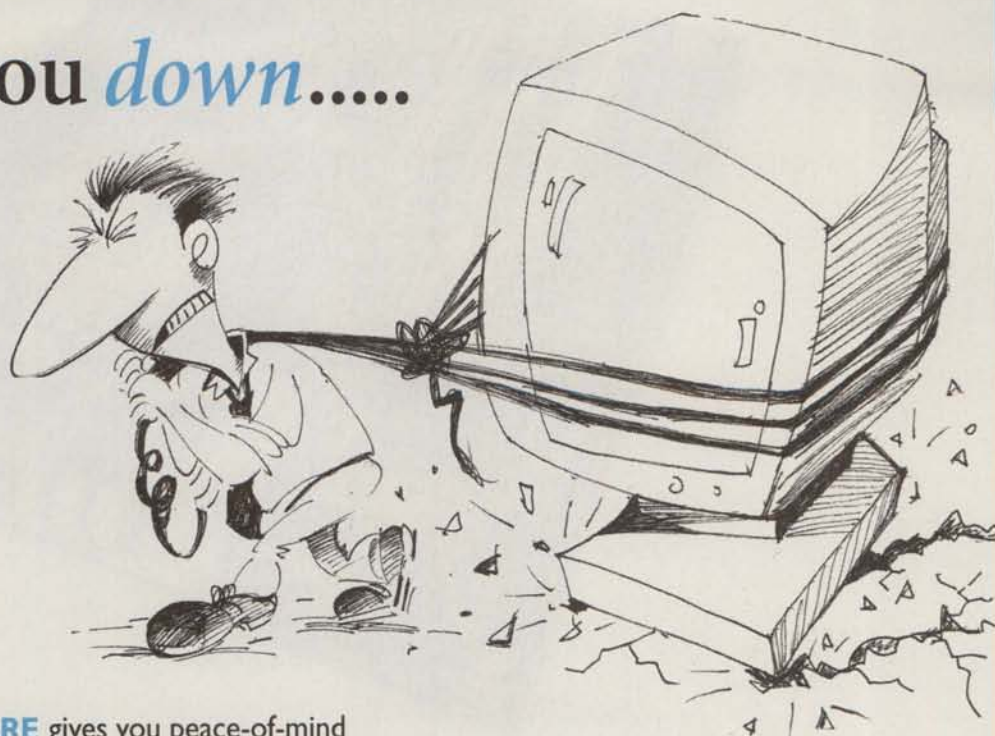
A morphing digital clock for the X desktop, developed by Jamie Zawinski.



SDF

SDF (Simple Document Format) is an easy-to-use document formatting and management system. Written in Perl, SDF allows you to use a single source file to generate documents in a variety of formats, including HTML and PostScript.

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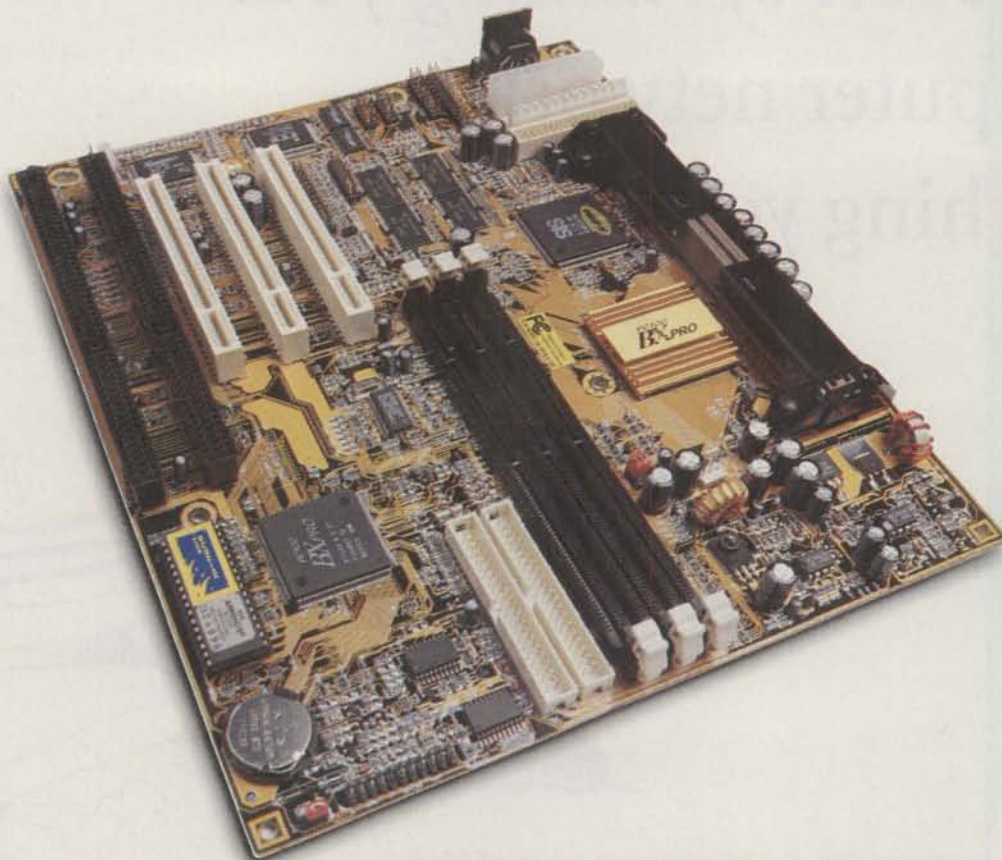
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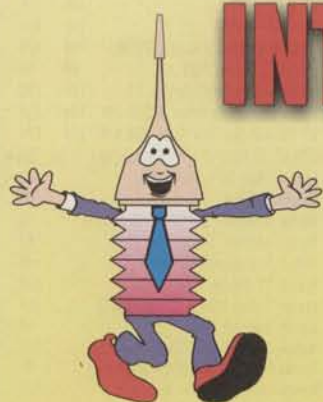


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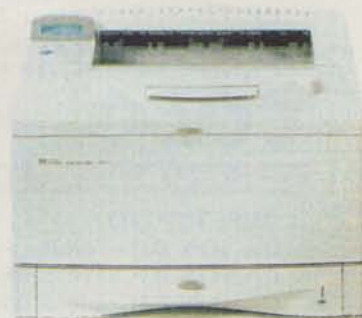
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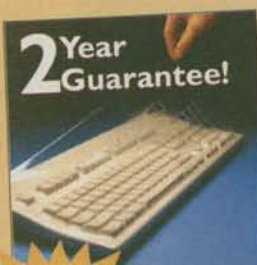


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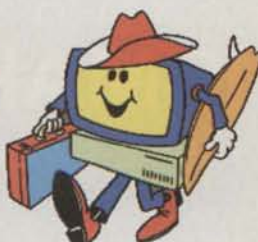
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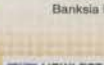
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BLACK

REFILLS

K2BK	6
K1BK	6
K2BK	6
K2BK	6
K3BK	6
K5BK	6
K3BK	6
K1BK	6
K5BK	6
K7BK	6 0
K8BK	6
K4BK	8
K9BK	7
K10BK	1 2
K11BK	8
K12BK	5 0
K19BK	3
K13BK	1 2
K16BK	8
K14BK	1 2
K15BK	1 2
K16BK	1 2
K17BK	1 2
K17BK	1 2
K21BK	3
K17BK	1 2
K18BK	6
K24BK	6
K25BK	6
K20BK	6

COLOUR

REFILLS

K9CLR	1 2
K9CLR	1 2
K10CLR	1 2
K14CLR photo	1 2
K11CLR	6
K12CLR	6
K22CLR	6
K9CLR	1 2
K12CLR	3
K25CLR	6
K1CLR	3 0
K2CLR	1 2
K2CLR	1 2
K23CLR	1 2
K4CLR	4
K3CLR	1 2
K4CLR	1 2
K5CLR	3 0
K18CLR	6
K21CLR	6
K15CLR	6
K24CLR	6
K20CLR	6
K7CLR	1 2
K6CLR	6
K6CLR	6
K7CLR	1 2
K20CLR	1 2
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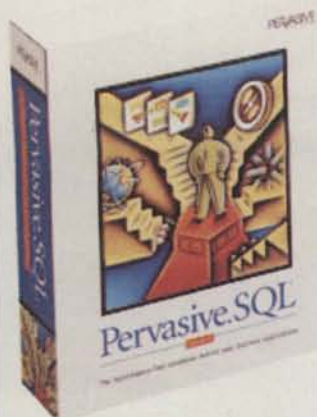
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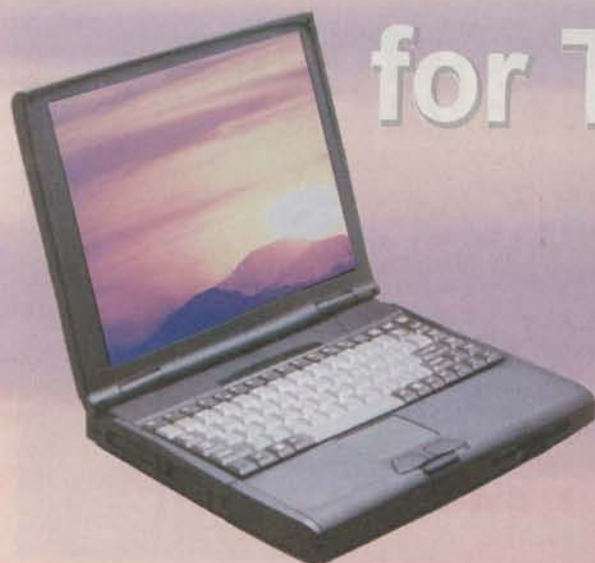
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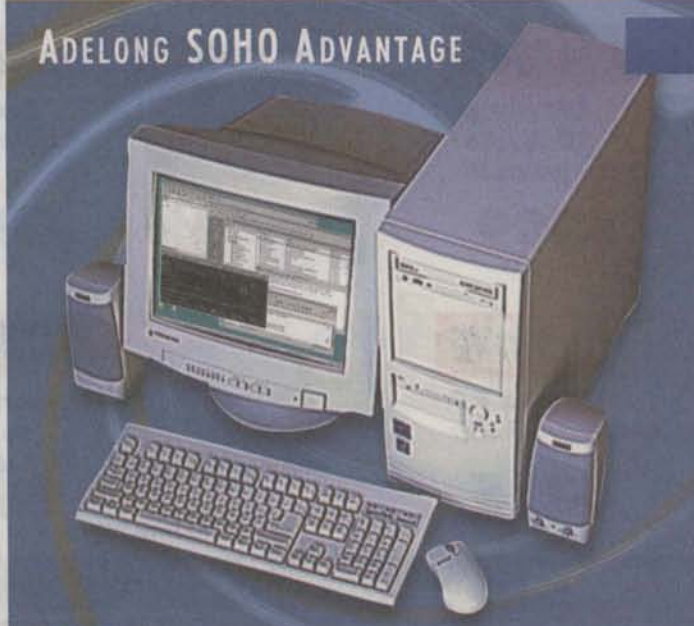
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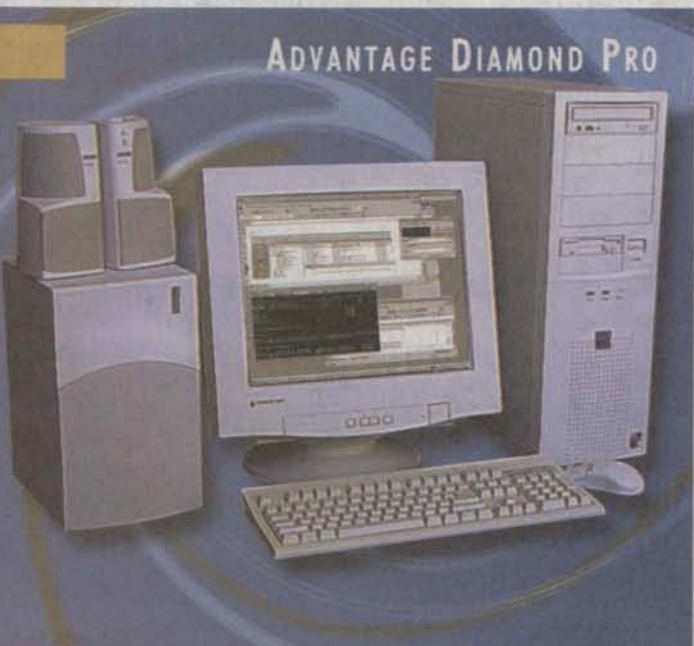
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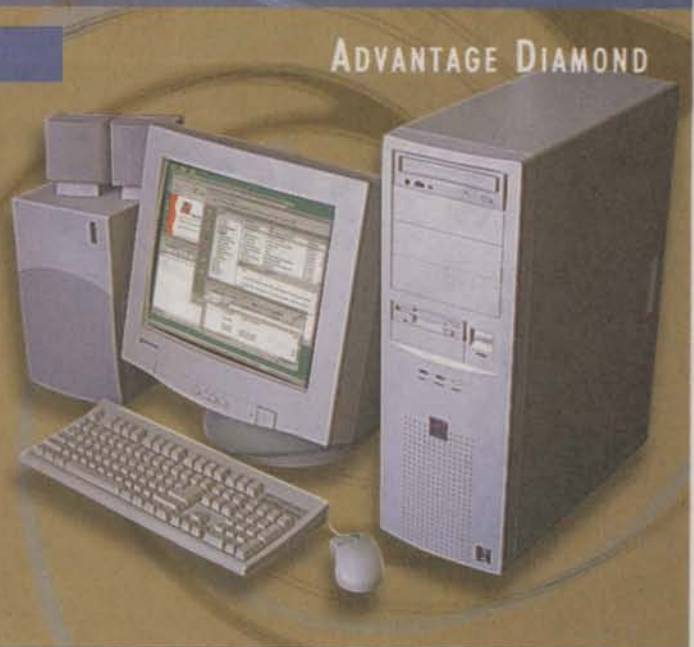
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PV-5000A

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FDD	External 1.44MB with Port Replicator
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PA3CO000



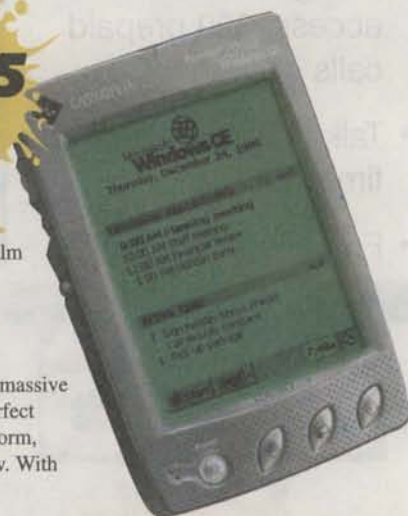
Don't let the small size fool you. The Palm III organizer is the latest addition to the award-winning line of smart and connected organizers from 3Com. At just 4.7" tall and only 6 ounces (batteries and all!), you'll be surprised at how much power this device gives. With a Palm III organizer, all your important information is instantly accessible. The date book, address book, e-mail, to do list, expense and memo applications are right at your fingertips.

Cassiopeia

Memory	8Mb Ram, Compact Flash Card Slot
Operating system	Windows CE 2.0
Size	124 x 81.5 x 18.2mm
Weight	186g (batteries included)
Battery Life	AAA batteries approximately 25 hours batterie life
Connectivity	RS-232C 9-Pin connector & 25-pin adapter, Infra Red port (IRDA)
Applications	Contacts, Calander, Tasks, Notetaker, Mobile Channels, Voice recorder, Palm Golf, Casio Image Viewer, Casio Menu, Randsoft Harmony 98, Quicken ExpensAble, Meeting Minder Application, Pocket commander, Financial Consultant Calculator, Casio Find File Utility

\$745

PACAS000



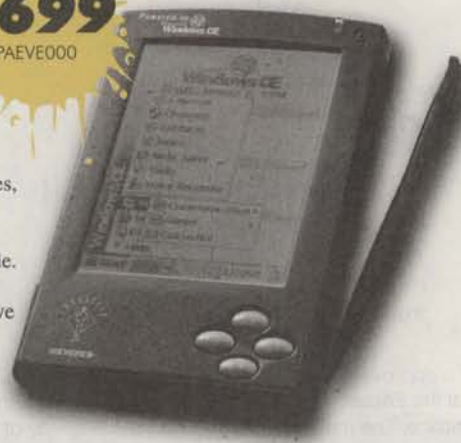
The NEW Cassiopeia E-11 Palm-size PC is a breakthrough in mobile information management. Its massive 8MB of RAM and compact, lightweight size and large bright back-lit display make the E-11 the perfect tool for information on-the-go. And because the E-11 operates on the versatile Windows CE® platform, you can be sure that your investment will accommodate you as your mobile information needs grow. With pen-based navigation and long battery life, its the perfect tool for remote connectivity and contact management.

Everex Freestyle Associate

Memory	8Mb Rom, 4Mb Ram
Operating system	Windows CE 2.0
Size	122 x 90 x 38.2mm
Weight	160g
Battery Life	AAA NiMH rechargeable batteries
Connectivity	RS-232C 9-Pin connector & 25-pin adapter, Infra Red port (IRDA)
Applications	Pocket Outlook, Calander, Contacts, Tasks, Note Taker, Rich Ink Notes, Voice Notes, Inbox, Mobile Channels.

\$699

PAEVE000



If you are looking for a Windows CE PDA with a difference, take a look at the Everex Freestyle. Designed to optimize your business and personal productivity, each Freestyle unit has several attractive features that separate it from the rest. They include, Vibrating Notification, Innovative foldable MobileCradle, Rechargeable batteries recharge inside the Freestyle and Active Sync technology allows you to synchronize your data instantly. No pushing of buttons or opening of applications.



Processor/RAM/HDD



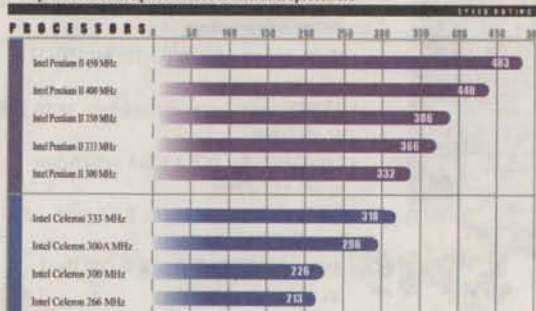
Adelong Computers

Code	Model	Price
CPINT020	Celeron 300A with 128KB Cache	\$225
CPINT021	Celeron 333 with 128KB Cache	\$285
CPINT022	Celeron 366MHz with 128KB Cache	\$425
CPINT025	Celeron 400MHz with 128KB Cache	\$475
CPINT023	Celeron 333MHz PPGA*	\$259
CPINT024	Celeron 366MHz PPGA*	\$379
CPINT015	Pentium II 350MHz Processor	\$449
CPINT016	Pentium II 400MHz Processor	\$769
CPINT017	Pentium II 450MHz Processor	\$1345

*PPGA CPU are compatible with Intel ZX Mainboards. Call for details

iCOMP Index 2.0

Compares the relative performance of Intel microprocessors



AMD

Code	Model	Price
CPAMD009	AMD K6-2 300	\$189
CPAMD010	AMD K6-2 350	\$309
CPAMD013	AMD K6-2 380	\$Call
CPAMD014	AMD K6-2 400	\$Call

Cyrix

Code	Model	Price
CPIBM008	M2-300MHZ	\$199
CPIBM009	M2-333MHZ	\$229

Memory

SDRAM - For use in current Pentium / Pentium II systems utilising Intel TX / LX / BX Chipsets. 100MHz for Intel BX Chipsets. Use individually. All SDRAM is 168 Pin.

Code	Model	Price
RAGEN008	32MB SDRAM	\$95
RAGEN009	64MB SDRAM	\$199
RAGEN021	128MB SDRAM	\$389

RAGEN022	64MB 100MHz SDRAM	\$209
RAGEN023	128MB 100MHz SDRAM	\$399

* For use with Intel BX & Super Socket 7 Mainboards

EDO RAM - For use in newer 486 systems and most Pentium / Pentium Pro style systems. Used in pairs in Pentiums & Pentium Pro's.

Code	Model	Price
RAGEN005	16MB EDO SIMM 72 Pin	\$75
RAGEN006	32MB EDO SIMM 72 Pin	\$139

Fast Page RAM - For use in older 486 & Pentium systems and some printers. Use in pairs in Pentiums.

Code	Model	Price
RAGEN001	8MB SIMM 72 Pin	\$45
RAGEN002	16MB SIMM 72 Pin	\$89
RAGEN003	32MB SIMM 72 Pin	\$179

Hard Disks

Quantum Fireball EL

Quantum is renowned for **quality** and **performance**. It has a fast average seek time - 9.5 milliseconds and internal data rates up to 158 megabyte per second at 5400 rpm. It also uses the Ultra ATA interface, with a data burst transfer rate of 33.3 megabytes per second.

IDE 3.5" - Fireball

Code	Model	GB	Cache	I/Face	Motor RPM	Price
HDQTM037	Fireball EX	3.2	512KB	UDMA	5400	\$269
HDQTM028	Fireball EL	5.1	512KB	UDMA	5400	\$325
HDQTM029	Fireball EL	7.6	512KB	UDMA	5400	\$395
HDQTM038	Fireball EL	12.7	512KB	UDMA	5400	\$679



The Deskstar range of drive provide speed and performance for multimedia & disk intensive workstations. The DeskStar GXP range goes further to bring the quickest possible speeds to the desktop today with a 7200RPM spindle speed.

IBM Ultra DMA33 - DESKSTAR HERCULES EIDE DRIVES

Code	Model	GB	Cache	I/Face	Motor RPM	Price
HDIBM006	DeskStar	4.3	512KB	UDMA	5400	\$315
HDIBM007	DeskStar	6.4	512KB	UDMA	5400	\$359
HDIBM008	DeskStar	8.4	512KB	UDMA	5400	\$389
HDIBM019	Titan	10.1	512KB	UDMA	5400	\$525
HDIBM020	Titan	13.5	512KB	UDMA	5400	\$725
HDIBM021	Titan	16.8	512KB	UDMA	5400	\$915
HDIBM022	Titan 14GXP	10.1	512KB	UDMA	7200	\$595
HDIBM023	Titan 14GXP	14.4	512KB	UDMA	7200	\$875

IBM SCSI - ULTRASTAR 9ES DRACO SCSI DRIVES

Code	Model	GB	Cache	I/Face	Motor RPM	Price
HDIBM009	DDRS 34560-50	4.5	512KB	Ultra	7200	\$655
HDIBM010	DDRS 34560-68	4.5	512KB	U/W	7200	\$695
HDIBM011	DDRS 39130-50	9.1	512KB	Ultra	7200	\$1210
HDIBM012	DDRS 39130-68	9.1	512KB	U/W	7200	\$1265

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday
Technical Support (5 Days a week 9am-6pm) Phone (02) 8344 3160



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Sales Hotline 02 8344 3190

Gigabyte Mainboards

GA-6BXE



- ◆ Intel BX Chipset
- ◆ Supports up to Intel Pentium II 450Mhz & Celeron Processors
- ◆ Multiply bus speeds 66/ 75/ 84/ 100/ 112/ 133Mhz
- ◆ 4 DIMM modules accommodate up to 1GB of memory
- ◆ 1 x AGPx2, 5 x PCI, 2 x ISA expansion slots, ATX Form
- ◆ 2 x Ultra DMA IDE Ports, 2 x Serial, 1 x Parallel, USB, PS/2
- ◆ Auto detect CPU Voltage & CPU Heat monitoring system
- ◆ ACOPS support

\$249
MBGIG018

AWARD
WINNING

GA-6BXDU

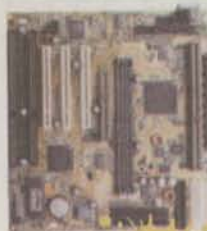


- ◆ Intel BX Chipset
- ◆ Supports up to TWO Intel Pentium II 450Mhz & Celeron Processors
- ◆ Multiply bus speeds 66/ 100Mhz
- ◆ 4 DIMM modules accommodate up to 1GB of memory
- ◆ Onboard Adaptec 7896 Dual Channel Ultra 2 SCSI
- ◆ 1 x AGPx2, 4 x PCI, 3 x ISA expansion slots, ATX Form
- ◆ 2 x Ultra DMA IDE Ports, 2 x Serial, 1 x Parallel, USB, PS/2
- ◆ Auto detect CPU Voltage
- ◆ ACOPS support

\$799
MBGIG019

ON
BOARD
SCSI

GA-6EA



- ◆ Intel EX Chipset
- ◆ Supports Intel Pentium II & Celeron Processors to 333Mhz
- ◆ Multiply bus speeds 66/ 75/ 83Mhz
- ◆ 2 DIMM modules accommodate up to 256MB of memory
- ◆ 1 x AGPx2, 3 x PCI, 2 x ISA expansion slots, Baby AT Form
- ◆ 2 x Ultra DMA IDE Ports, 2 x Serial, 1 x Parallel, USB, PS/2
- ◆ Auto detect CPU Voltage

\$179
MBGIG020

GA-5AA



- ◆ SIS 5591 AGPset
- ◆ Supports Intel Pentium to 233Mhz, AMD & AMD K6-2 to 350Mhz, IBM/Cyrix, IDT
- ◆ Multiply bus speeds 60 /66/ 75/ 83/ 95/ 100Mhz
- ◆ CPU Voltage 2.0V - 3.5V
- ◆ 3 DIMM modules accommodate up to 768MB of memory
- ◆ 1 x AGPx2, 4 x PCI, 2 x ISA expansion slots, ATX Form
- ◆ 2 x Ultra DMA IDE Ports, 2 x Serial, 1 x Parallel
- ◆ CPU Temperature sensor

\$159
MBGIG021

SOCKET 7



ASUS

P2B-D Dual Pentium II Mainboard

- ◆ Intel BX Chipset
- ◆ Accommodates up to 2 x Intel Pentium II Processors
- ◆ 4 x 168Pin DIMM Sockets support up to 1GB
- ◆ 1 x AGPx2, 4 x PCI, 2 x ISA Expansion slots
- ◆ 66/75/83/100/103/112/133 System Clock select
- ◆ Onboard Serial/Parallel/USB Ports
- ◆ LANDesk Client Manager & PC-Cillin Virus Utility Bundled

MBAUS000 **\$675**

SCSI



P5A-B Smart Mainboard

- ◆ Ali Aladdin V Chipset
- ◆ Accommodates Intel Pentium P54, P55, AMD K6-2 266-350Mhz, IBM/Cyrix MII & 6x86MX
- ◆ 3 x 168Pin DIMM Sockets support up to 384MB
- ◆ 1 x AGPx2, 3 x PCI, 2 x ISA Expansion slots
- ◆ 66/75/83.5/100 System Clock select
- ◆ Onboard Serial/Parallel/USB Ports
- ◆ LANDesk Client Manager
- ◆ AT Form Factor

MBAUS002 **\$195**



P2B Pentium II Mainboard

- ◆ Intel BX Chipset
- ◆ Accommodates Intel Pentium II Processors & Celeron
- ◆ 4 x 168Pin DIMM Sockets support up to 768MB
- ◆ 66/75/83/100/103/112/133 System Clock select
- ◆ 1 x AGPx2, 4 x PCI, 3 x ISA Expansion slots
- ◆ Onboard Serial/Parallel/USB Ports
- ◆ LANDesk Client Manager & PC-Cillin Virus Utility Bundled

MBAUS001 **\$315**



ASUS

Compatibility Means Reliability

Chaintech



Adealong Computers



\$649
MBCHA004

ON BOARD SCSI

CHAINTECH 6BDU

System Processor: Supports up to two 450MHz Intel Pentium® II processors
• Supports 66/100 MHz system clock speeds in BIOS
ChipSet: Intel 82440BX two chip PCset Accelerated Graphics Port (AGP)

DRAM Memory

• Supports up to 512MB SDRAM

Two Ultra DMA-33 IDE

Ports

Ultra2 SCSI with RAIDport

III On Board

• AIC 7880 SCSI controller and AIC-3860 chip, supports up to 80Mbps (Ultra2 SCSI)

ATX Form



\$175
MBCHA005

CHAINTECH 6ESA

System Processor: Supports up to 333MHz Intel Pentium® II & Celeron® processors
• Supports 60/66 MHz system clock speeds

ChipSet Intel 82440EX

two chip PCset

Accelerated Graphics Port (AGP)

DRAM Memory

• Two 168-pin DIMM sockets support up to 256MB 5 DRAM

Two Ultra DMA-33 IDE Ports

Audio Subsystem

Micro-ATX Form



\$169
MBCHA006

AMD-K6-2 compatible

CHAINTECH SAGM2

System Processor: Supports up to 233MHz Pentium processors with MMX™ technology
• Supports 6x86MX and MII-300 processors
• Supports 166-350MHz K6™ and K6-2™ processors
• Supports 60/66/100 MHz system clock speeds

ChipSet VIA MVP3

(82C598AT/82C586) two chip AGPset

Accelerated Graphics Port (AGP)

L2 Cache • 512KB built-in

Pipeline Burst SRAM

DRAM Memory

• Three 168-pin 3.3v unbuffered DIMM sockets support up to 256MB PC66 & PC100 SDRAM Compatible

Two Ultra DMA-33 IDE Port



\$259
MBCHA003

CHAINTECH 6BTM

System Processor:

• Supports up to 450MHz Intel Pentium II processors
• Slot 1 CPU socket with retention mechanism
• Supports 66/100MHz system clock speeds
• Innovative CPU technology (simple CPU installation via BIOS)

ChipSet:

• Intel 82440BX Chipset

PCset

AGP Graphics Port

Bios:

• Award System BIOS with PnP, APM, DMI, CPU throttling and Multi-device booting features

Ultra DMA-33 IDE Ports:

Two USB Ports On Board / FCC Class B & CE EMI Regulation Compliant

Modems

US Robotics®

NEW

The new 3Com Message Modem and Professional Message Modem are innovative enhanced voice/fax/data modems. These external modems feature V90 as well as x2 technology, making them one of the fastest modems available on the market. Both modems can store incoming messages when the computer is switched off. Up to 20mins. of voice or approx. 50 pages of fax can be received and remotely retrieved.

The professional version adds features like caller ID, speaker phone and fax forwarding.

The two message modems join the 3Com's range of award winning sportster and courier modems

Code	Model
FMROB006	3COM USR Sportster modem 56k V.90
FMROB011	3COM USR Message modem 56k
FMROB012	3COM USR Professional message modem 56k V.90



Price
\$219
\$269
\$295

\$295
FMROB012

Netcomm Roadstar II

Supporting both 56K Flex & V.90 standards, Australia's best selling modem, the Netcomm Roadstar II will let you surf the Internet at today's fastest speeds.

- SVD Technology allows you to talk whilst sending data simultaneously
- Full voice capabilities with voicemail. Headset included
- Full version of Winfax Pro 8



FMNET012 **\$259**

FMNET015 **\$275** **USB**

Banksia Wave SP 56Kflex V.90

The Wave SP 56 supports both V.90 and K56flex standards to ensure you have no disruptions to your 56K modem connections. A smart answerphone facility provides multiple mailboxes for up to 9 people. Voicemail messages can also be accessed remotely so you don't have to be in the office to receive your faxes.

- SVD Technology
- Full Duplex Speakerphone allows you to use your PC just like a telephone



FMBAN003 **\$235**

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday
Technical Support (5 Days a week 9am-6pm) Phone (02) 8344 3160



Sales Hotline 02 8344 3190

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Video & Sound Cards



EAGLE

EAGLE VOODOO II PCI GRAPHICS CARD

...for FOR THE ULTIMATE 2D/3D GAME EXPERIENCE!

- Features:**
- 12MB of high performance EDO RAM
 - Based on 3Dfx Voodoo2 chipset with dual texture engines
 - Full Direct3D hardware acceleration and compatible with 3Dfx Glide titles
 - SLI (Scan Line Interleave) connector and SVGA loopback cable included
 - Support any 2D graphics system through a video passthrough connector

12MB

\$249

DCEAG004

EAGLE i740 AGP VGA CARD

FOR BLISTERING PERFORMANCE AT AN AFFORDABLE PRICE!

- Features:**
- Using Intel 740 High Performance chipset
 - Full AGP 1.0 compliant and Full feature AGP 2x Implement
 - 3D Graphics Enhancements:
 - Support High-Quality MPEG1 and MPEG2 playback
 - Supports DirectX and OpenGL

DCEAG005

\$85

S3 Trio3D AGP VGA CARD

...for 3D graphic enhancement!

- Features:**
- Using S3 86C365 3D High Performance Chipset
 - High performance 3D graphics engine.
 - Drivers for all major operating systems

4MB

DCEAG006

\$55

DCEAG002 4MB 3D FX Voodoo 3D Accelerator **\$145**

DCEAG001 4MB S2 Virge 3D PCI VGA Card **\$49**

DCEAG001 2MB S2 Virge 3D PCI VGA Card **\$53**

MMRAG001 ES1938 (SOLO-I) PCI Sound Card **\$39**

Multimedia



Millennium G200

Extreme Games Acceleration At Unbelievable Frame Rates

- High speed 250MHz RAMDAC
- High quality 3D rendering engine
- High performance AGP 2X support
- MGA - G200 128 bit dual buff graphics chip
- 8mb SG Ram upgradeable to 16MB

\$310

DCMAT023



Marvel G200

- Captures high quality video images or clips from a TV, VCR or Video
- Camera to your Hard Disk
- Record video back to VHS tape
- Software Titles
- Ulead Media Studio 5.0VE
- Avid Cinema
- Photo Express V2
- Tonic Trouble

\$525

DCMAT029

Blazing Fast 2D & 3D Graphics

- Award winning G200 chipset
- 128-bit Dualbus graphics
- Full AGP 2x or PCI
- 8MB SDRAM memory, upgradeable to 16MB

- Fast 230Mhz RAMDAC
- PC to TV & Video Output & Frame Capture
- Displays 3D games and DVD video on your TV

Based on 3Dfx Interactive's exciting new Voodoo Banshee™ chip, 3D Blaster Banshee combines an entirely new state-of-the-art 128-bit 2D engine, 128-bit VGA and video support with the 3D rendering power of its powerful Voodoo2™ technology. Moreover, with 3Dfx Interactive's extensive developer support, PCs equipped with Voodoo Banshee can run more than 250 of the most popular 3D games that have been specifically enhanced for Voodoo2 and Voodoo Graphics®.



PCI **\$279**
MMCRE029

AGP **\$279**
MMCRE030



\$295
MMCRE031

"Sound Blaster Live! Value, will bring its users to new heights of enjoyment at their desktop PC". At the heart of Sound Blaster Live! Value is the EMU10K1™, the most powerful audio processor chip - with 1000+MIPS and 2 million transistors - ever designed by the joint E-mu/Creative Technology Center. The audio processor engine provides digital signal processing at 32-bit, 48kHz using a patented 8-point interpolation to smoothen the sound - instantly improving any audio source.

Diamond Multimedia

www.diamondmm.com.au



Adelong Computers



Sonic Impact S90

Hot 3D Wavetable Audio!

Diamond's Sonic Impact S90 uses advanced A3D technology to bring life-like positional 3D game play to your PC. Sonic Impact S90 includes hardware acceleration for 64 wavetable voices and Aureal's A3D to immerse you in the middle of the action. Add realistic atmospheric effects, including fog and underwater sounds, and you have total audio transformation for your PC.

- PCI design for faster system performance
- 64 Hardware wavetable voices
- Supports downloadable samples
- Runs with DOS, Win95/98, Win NT 4.0

MMDIA010 **\$110** RETAIL
MMDIA008 **\$75** OEM

Monster Fusion

2D & 3D Acceleration

Monster Fusion combines 16MB of 3D gaming power with fantastic 2D graphics acceleration, all in a single card. Diamond has built on 3Dfx's Voodoo Banshee technology to deliver 1920 X1440 resolutions and 60+ frames/second game play. Yes, it's Fusion Time, baby!

- Available in PCI and AGP configurations
- Supports Glide, Direct3D and OpenGL API's
- Explosive software bundle in special retail packs



DCDIA019
\$279
AGP OEM

DCDIA020
\$309
AGP RETAIL

DCDIA021
\$309
PCI RETAIL



Viper V550

The Viper V550 from Diamond features unprecedented 128-bit power for the state-of-the-art 2D graphics and stunning 3D quality for high-speed game play, business and professional graphics. Fully optimised for Windows 98, Viper V550 is the next generation in high performance graphics acceleration. Available in PCI and AGP 2X configurations

- Featuring 16MB of SDRAM
- 128-bit dual processor architecture
- Accelerates OpenGL and DirectX
- Supports software DVD

DCDIA017 **\$309** AGPOEM
DCDIA016 **\$353** PCI
DCDIA018 **\$349** AGP

Monster Sound MX300

Ultimate 3D Audio Experience!!

Want to annihilate your opponents every time? Diamond's Monster Sound MX300 gives you awesome combat tools: Aureal's latest A3D 2.0 positional audio, 4-speaker support and 64-voice hardware wavetable synthesis. Imagine playing your favourite PC game hearing footsteps from behind you and gun shots from overhead. Monster Sound MX300 delivers unbelievable 3D effects to give you the unfair advantage.



- Hardware A3D 2.0 acceleration
- 9.6 audio systems
- Features Dolby Digital (AC-3) support
- Advanced 320-voice wavetable with support for downloadable samples
- Supports DOS and Windows games

\$209
MMDIA011

Rio PMP300

Internet Music in the Palm of Your Hand!

The first portable MP3 music player that stores up to 60 minutes of digital quality sound. Load the latest songs on to Rio directly from your Hard Drive, personal CD's or the Internet and carry them with you. It's smaller than an audio cassette and has no moving parts, so it never skips. Powered by a single AA battery, Rio provides up to 12 hours of continuous music playback.

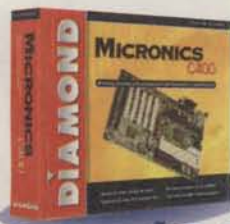
- Lightweight - only 70 grams
- Palm size for easy portability
- 32MB built-in flash memory

\$459
MMDIA012



Micronics C400

The Ultimate Multimedia Platform



Diamond's Micronics C400 motherboard is the perfect platform for your ultimate multimedia system. Featuring Intel's 440BX AGPset, it supports Pentium II and Celeron processor up to 450MHz, Ultra DMA/33, USB, IR communications and advanced system monitoring features. For your totally accelerated PC, start with the best!

\$269
MBDIA000

- 5 PCI slots (1 shared)
- Award BIOS on 1MB flash
- Legendary Micronics quality and performance

HomeFree

Easy Wireless Networking!



No holes! No cables! HomeFree delivers 1MB wireless links for up to 16 PCs, 45 metres apart. Includes point-and-click network setup, software for shared Internet access, all at an incredible price. Windows 95/98 only.

Desktop to Desktop
\$439
NWDIA000

Desktop to Notebook
\$509
NWDIA001

- Frequency hopping for maximum security
- 45-metre range
- Each kit contains 2 nodes

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday
Technical Support (5 Days a week 9am-6pm) Phone (02) 8344 3160



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Sales Hotline 02 8344 3190

ALTEC LANSING

Altec Lansing

ADA305 Digital PowerCube

The ADA305 Digital PowerCube delivers multidimensional audio excitement resulting from a Dolby Pro Logic decoder in the subwoofer. To deliver the multichannel audio, the Digital PowerCube uses Altec Lansing's patented side-firing speakers so that the audio is driven to the side and rear for a true multidimensional audio experience.

- 20 Watts RMS Satellite Speakers
- 2 x 3" full range drivers
- 6" Subwoofer
- Frequency Response 20Hz - 20Khz
- USB ready

\$399 MMALT006

NEW



ACS45 PowerCube Speaker System

Introducing the Altec Lansing ACS45 PowerCube Speakers, a three piece multimedia audio solution at an unbelievable price. Experience the enhanced output of the PowerCube satellite system. Great for games and CD's, the ACS45 will bring hi-fi audio to your computer desktop today.

- 6 Watts RMS Satellite Speakers
- 3" full range driver
- 20 Watts RMS, 6" subwoofer
- frequency response 35Hz - 20 KHz

\$195 MMALT001

BEST Speaker under \$200



PC MAGAZINE AUSTRALIA EDITORS' CHOICE

ACS500 Surround Sound Speaker System

This superb three piece system delivers five channels of surround sound featuring Dolby Pro-Logic for Multidimensional excitement. The Satellite tower speakers deliver direct stereo imaging for hi-fi audiophile sound whilst giving the option for center and surround channel effects & sounds.

- 22.5 Watts RMS Satellite Speakers
- 2 x 3" full midrange driver
- 1/2" dome tweeter
- 40 Watts RMS, 6.5" subwoofer
- frequency response 35Hz - 20 KHz

\$450 MMALT004



ACS48 PowerCube Plus Speaker System

The PowerCube Speaker System, from Altec Lansing is the market's leading affordable audiophile multimedia audio solution for the home or office. Comprising of a 3 unit system, allows you to experience hi-fi quality audio from your CDs, games or the Internet. In addition, the Powercube Plus 6" subwoofer is encased in wood, offering you a deeper low frequency response.

- 20 Watts RMS Satellite Speakers
- 3" full range driver
- 3/4" high frequency driver
- 40 Watts RMS, 6" subwoofer
- frequency response 35Hz - 20 KHz

\$289 MMALT003

January 1998



PC MAGAZINE AUSTRALIA EDITORS' CHOICE

ACS91 Altec Lansing

The ACS91 PowerCube speaker system delivers powerful audio output to suit the home or office computer. Maintaining the tradition of audio quality synonymous with Altec Lansing these speakers are now available at an unbelievable price.

- 5 Watts RMS Satellite Speakers
- 3" full range driver
- frequency response 90Hz - 20 KHz

\$79 MMALT000



Umax Scanners

Astra 1220 series - Includes Adobe PhotoDeluxe

The Affordable 36 bit professional scanning solution

The Astra 1220 series was designed specifically for corporate or small office users who want something more from their scanner. Built with a 36 bit colour CCD, the Astra

1220 captures an amazing 68.7 billion colours to bring all your images to life. A complete range of easy to use software is included with the 1220, making it a versatile tool for any user. Perform OCR with astonishing accuracy or scan images to add a splash of colour to your documents. The opportunities are endless with the UMAX Astra 1220.

- 1200 x 600dpi optical resolution for crisp, vibrant images
- 9600dpi max. resolution for smooth lineart & image magnification
- A 36 bit colour depth captures 68.7 billion colours
- A4 scanning area (216 x 297mm)
- Single pass colour CCD for fast, productive scanning

1220S **\$495**

SCSI

IOUMA005

1220U **\$345**

USB

iMac compatible

IOUMA006

1220P **\$279**

PARALLEL

IOUMA00

Astra 610 series

The compact plug 'n' play colour scanner for home and office users

Add the colour and vitality of images to everything you do on your computer with a new Astra 610 series scanner. After plugging it in and installing the software, simply press the 'on' button at the front of the scanner and you're ready to go - it's that easy!

- 600 x 300dpi optical resolution for crisp, vibrant images
- 4800dpi max. resolution for smooth lineart & image magnification
- Captures over 1 billion colours through 30 bit scanning

- A4 scanning area (216 x 297mm)
- Single pass colour CCD for fast, productive scanning
- Extensive software package handles all your creative and scanning needs

610P **\$165**

IOUMA002

PARALLEL

610S **\$279**

IOUMA003

SCSI

SCSI
Interface
Included

Digital Cameras & Scanners



Nikon Coolpix 900 Digital Camera

The Coolpix 900s is a 1.3 million pixel, 8mb digital camera. It uses a traditional 9 element Nikkor lens including a 3 x Optical zoom, precision 945 focus steps and 3 metering modes to capture true Nikon quality shots.

- High Resolution 1280 x 960 pixels - JPEG format
- 8mb Compact Flash memory card
- High Res 114000 pixel TFT LCD screen + Optical viewfinder
- 3 x Optical Zoom and 2 x digital doubler
- Multi Synch External Flash Terminal
- Latest power saving technology
- Spot, Centre weighted and Matrix metering options
- 2 frames a second in VGA mode
- Accepts fisheye and wideangle Nikkor converters
- Built in Flash
- AC Adaptor available
- Adobe PhotoDeluxe™ software

IONIK002

\$1745

Nikon

Nikon LS-2000 Film Scanner

The new Nikon Super Coolscan 2000 is a high resolution 2700 dpi, 12 bit A/D scanner able to scan each image in just 20 seconds. The new Coolscan 2000 uses new 'CleanImage' technology removing dust, scratches and other defects from the image.

- Full colour 2700 dpi scans in 20 seconds
- Batch Scanning
- Hot Swappable adapters - Film Strips or APS Film Adaptor
- Auto Slide Feeder SF-200 option (50 Slides)
- Negatives or Transparencies
- Autofocus
- Adobe Photoshop LE

IONIK000

\$2445

Nikon LS-30 Coolscan III Film Scanner

The new LS-30 Coolscan III is a 2700 dpi, 10 bit A/D conversion scanner which will scan at full resolution in just 30 seconds. The Coolscan III uses CleanImage™ dust and scratch removal and will accept the Hot Swappable adaptors.

- Full colour 2700 dpi scans in 20-30 seconds
- Hot Swappable adapters - Film strips or APS Film Adaptor
- Nikon Colour Management
- Autofocus
- Clean Image™
- Negatives or Transparencies
- Adobe PhotoDeluxe™ 2.0

IONIK001

\$1359



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1

Jaz 2 Drive

Want portability
and blistering speed?

The new format Jaz disks hold up to 2GB of data each. Jaz 2GB drives are 100% compatible with 1GB disks. Works with both MACs and PCs via an external SCSI interface.

JAZ 2GB DRIVE
(SCSI EXT.)

\$769
BUIOM018

JAZ 2GB DRIVE
(SCSI INT.)

\$759
BUIOM017



2GB

lomega Buz

All the hardware and
software you need
to be a video genius

Introducing the lomega Buz

-the easiest way to get
multimedia from camcorders,
DVD, CD-Roms, VCRs and laserdiscs
into your PC! It's a video capture and
editing board combined with an Ultra
SCSI controller that lets you:

- Capture Multimedia (fullmotion) video, sounds,
digital pictures, music) into a PC
- Edit it using the easiest software around



\$369
BUIOM023

Apple Mac

\$535
BUIOM027

Available in Mac format

zip

Media Accessories

jaz

Code	Model
BUIOM012	100MB PC ZIP DISKS (1 PER PACK)
BUIOM005	100MB PC ZIP DISKS (3 PER PACK)
BUIOM006	100MB PC ZIP DISKS (10 PER PACK)

Price	Code	Model	Price
\$24	BUIOM020	JAZ MEDIA 1GB PC DISK (1 PER PACK)	\$190
\$69	BUIOM008	JAZ MEDIA 1GB PC DISKS (3 PER PACK)	\$529
\$195	BUIOM024	JAZ MEDIA 2GB PC DISK (1 PER PACK)	\$199
	BUIOM025	JAZ MEDIA 2GB PC DISKS (3 PER PACK)	\$580

NEW USB ZIP 100MB DRIVE

Compatible with USB enabled PCs
running Windows 95 Release B/C,
Windows 98 and the Apple
iMAC computers.

\$315
BUIOM026



NEW 250MB ZIP DRIVE

Backward compatible with the 100MB
ZIP disks and the new 250MB Zip disk
from lomega. Available in both
Parallel and SCSI.

COMING SOON



Zip Drive

Expand your hard
drive without limits

Heading Increase your storage quickly, easily
and economically - as you need it. With
100MB Zip disks you can add as many disks
as you need. Available in three types.
Parallel / SCSI Mode / ATAPI

ZIP DRIVE SCSI

\$245
BUIOM001

ZIP DRIVE
PARALLEL

\$245
BUIOM000



Retail ATAPI

100MB ZIP ATAPI

\$225
BUIOM028

100MB ZIP
ATAPI OEM

\$173
BUIOM007



\$199
BUIOM022

Zip Card

PCMCIA to SCSI adapter. Zip card is a PCMCIA to SCSI
adapter card that, when connected to your notebook
computer and a SCSI Zip Drive, allows you to get 2-5
times the performance over a parallel port Zip Model.

...the fastest and most convenient way to
run a zip drive on your notebook

Jaz Traveller

Portability Solution...

Jaz Traveller is a SCSI to parallel port converter for the
Jaz drive. The Jaz Traveller allows you to connect an
external Jaz drive to the parallel port on the IBM-
compatible computers.



\$95
BUIOM013

Printers & Scanners

Canon



Adelong Computers



BJC-50 PRCAN020 **\$585**

- Half the size of the BJC-80 but not half the performance.
- Featuring a InfraRed Port and LithiumIon Battery which is good for 100 A4 prints.
- Maximum resolution of 720dpi at up to 5.5ppm
- Snap in the optional scanner head for 360dpi full colour scanning.

PRCAN001 **\$135** Scanner head



BJC-80 PRCAN000 **\$329**

- Drop Modulation Technology - the dual drop size breakthrough that **produces smoother colour gradations.**
- Office laser quality finish & B&W speeds up to 5 pages per min. with dedicated black cartridge.
- Windows® 95 compatible IrDA infrared port for cable-less communications.
- Fits in half a briefcase & only 1.4Kg!
- **Optional scanner head for colour graphics, OCR & faxing.**

PRCAN001 **\$135** Scanner head



BJC-4310SP PRCAN021 **\$245**

NEW IMPROVED SUPER ECONOMY MODE

- drop modulation technology uses dual drop sizes for smoother colour graduations with standard and photo realism inks.
- optional photorealism inks for photo gold standard printing.
- speed black cartridge prints up to 4.5 pages / minute.
- optional colour scanner for image acquisition, fax and copying functions (with appropriate software)
- plus banner printing and better internet printing.



BJC-255SP PRCAN017 **\$169**

- Super Economy mode for colour and B&W.
- Photo Mode printing for colour that rivals more expensive four-colour systems.
- Prints up to 2400 B&W pages and 600 colour pages.
- New high capacity black cartridge 20% more ink, no extra cost.
- Up to 5 times the output of direct competitors.



BJC-5000 PRCAN022 **\$559**

- 1440 dpi resolution
- New dual cartridge printin system
- A3 capable
- 7 colour photo inks
- Up to 7.5 ppm print speed
- When you own a BJC-5000, you'll be able to take on any job with confidence.
- 7-colour photo printing
- The dual cartridges print up to 7.5 pages per minute in black and up to 3 pages per minute in colour.



BJC-7000 PRCAN012 **\$399**

- 7-colour ink system and 9 saturation levels per pixel for **incredibly rich photographic half-tones.**
- Combined total of 1088 print nozzles firing up to 10,000 drops per second!
- P-POP (Plain Paper Optimised Printing) gives plain paper a coated paper quality finish.
- Documents printed with P-POP are 99.4% water fast!

FB320P IOCAN002 **\$195**

All the advanced technology of the 620P at 300 dpi



FB620P IOCAN003 **\$272**

It takes up less desktop real estate than any other colour flatbed scanner on the planet yet still **delivers exceptional 600 dpi scanning performance-ideal for businesses** with a variety of scanning needs.

- New Contact Image Sensor technology
- Optical Resolution 600 dpi
- Maximum Resolution 2400 dpi x 2400dpi
- 30 bit Colour

PowerShot A5 IOCAN004 **\$1045**

- The new Canon PowerShots A5 is everything you've always wanted from a digital camera. In fact, it's the smallest digital camera ever engineered with 1024 x 768 (XGA) resolution.
- Complementing its ultra-sensitive, high resolution CCD, the PowerShot A5 comes with a high-quality, low-distortion, f/2.5 all-glass lens, ensuring consistently sharp images, shot after shot. Plus, the unique Stitch Assist mode makes it easy to create dramatic panoramas.



Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday
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WinCast TV Tuner

WinCast/TV

PCI-BUS TV, IMAGE CAPTURE AND INTERCAST DATA RECEPTION!

WinCast/TV is a single slot PCI card which has a 125-channel cable-ready TV tuner and a video digitizer.



With WinCast/TV you can:

- watch TV on your VGA screen in a resizable window
- input from your VCR or Cam Corder
- snap still video images
- grab motion video movies
- videos conference with PC video conerencing software like NetMeeting, CU-SeeMe, IPhone, VDOphone and more!

Plug-and-Play Installation

WinCast/TV's motion video capture will make digital video movies on your PC's hard disk.

Capture professional quality 24-bit video images with 4:2:2 digitizing.

Live TV-in-a-window on VGA monitors from 640x480 to 1280x1024 in up to 16 million colours.

Create high impact presentations with 320x240 AVI clip capture with real time preview.

\$265

MMHAU000

EPSON

Epson Printers

STYLUS COL. 740

The new EPSON Stylus 740 is targeted at business/corporate and professional graphics users. These are users who demand a printer offering the highest performance and speed, maximum output quality, flexible options and affordability in purchase price and running costs. Designed for both Microsoft Windows 3.x/95 and Macintosh, the EPSON Stylus COLOR 740 also features optional network connectivity and optional software PostScript RIP. Printing at 1440 x 720 DPI and a maximum of 7ppm the Stylus 740 eclipses many desktop laser printers whilst providing unrivaled photo reproduction



\$495
PREPS021

EPSON PHOTOPC 600

Superb digital image quality and full-featured camera performance come together in the new EPSON PhotoPC 600 colour digital camera. Featuring a 2" TFT color monitor and optical viewfinder the PhotoPC has 4MB of internal memory which can hold 50 standard VGA or 16 Fine mode XGA images. In addition the PhotoPC 600 is equipped with a wide-angle lens that's ideal for business use. What's more, it gives you up to 3 x digital step zoom for even greater versatility and Panorama mode for those extra wide scenes.



\$905
IOEPS005

EPSON STYLUS COLOUR 440

The EPSON Stylus COLOR 440 is a remarkable new printer that produces dazzling, photo-quality right out-of-the-box! The EPSON Stylus COLOR 400 features photo-quality output with print resolutions of up to 720 x 720 dpi on plain paper.



\$253
PREPS019

STYLUS COL. 640

1440X720 DPI, 3PPM, WIN COMP. With its remarkable 1440 x 720 dpi capability, the Epson Stylus COLOR 640 sets a new standard for cost-efficient, photo-quality colour printing without the need for expensive options.



\$320
PREPS020

STYLUS PHOTO EX.

The Epson Stylus Photo EX is the perfect printer for photo reproduction, pre-proof graphics. Industry-leading 1440dpi resolution with a six-colour ink system and A3 paper handling.



769
PREPS015

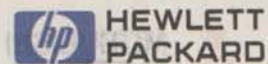
STYLUS COL. 850

It's industry-leading print resolution of up to 1440 dpi and high-speed printing capability makes the EPSON Stylus COLOR 850 the ideal printer for busy professionals. What's more, its ability to produce outstanding 1440 x 720 dpi printouts on plain paper allows eye-catching colour charts and graphics to be included in all printed material.



\$675
PREPS016

HP Printers



Adelong Computers

PRINTERS



\$290
PRHPD039

HP 695C Most Versatile Colour Printer with optional Photo Colour. Creates stunning Photographic Output using 6 Colour System. Handles both Hp Banner (continuous) Paper (up to 20 sheets) and standard Cut Sheets paper (up to 100 sheets/20 envelopes), Print Speed 5ppm Black 1.7ppm Colour.



\$795
PRHPD043

HP 895C DeskJet 895 Professional Series colour printer, with HP's exclusive PhotoREt II colour layering technology, delivers brilliant photo-quality images and sharp, elegant black text on a wide range of papers and other media. Exceptionally fast printing at up to 10 pages per minute black and 6 pages per minute colour. USB compatible with Windows98



\$799
PRHPD041

HP 1100 LaserJet Printer and all-in-one Printer Copier Scanner for any size business Quality laser printing - faster than ever. HP has always set the pace in laser printing technology. The new generation HP LaserJet 1100 series sets another impressive pace, delivering a stunning 8 pages per minute print speed. The 600 dpi print resolution with HP's Resolution Enhancement technology (REt) makes every document more professional.

Code	Model
PRHPD042	Deskjet 420C
PRHPD002	Deskjet 670C Colour inkjet Printer 600dpi
PRHPD040	Deskjet 710C 3ppm Color /6ppm Black
PRHPD031	Deskjet 720C Printer 8ppm Black 600dpi
PRHPD032	Deskjet 1120C A3

Price
\$185
\$239
\$419
\$485
\$840

Code	Model
PRHPD036	Deskjet 2000C
PRHPD009	Laserjet 6L 6ppm at 600dpi Black
PRHPD046	Laserjet 1100A Printer Plus Scanner
PRHPD010	Laserjet 6P 8ppm 600dpi
PRHPD011	Laserjet 6MP with Postscript

Price
\$1429
\$645
\$945
\$1310
\$1644

SCANNERS

HP Entry Level Flatbed Full Colour Scanner ideal for General Purpose Scanning, and OCR Work. Flatbed Design allows scanning of bound documents and book. Features: 600dpi optical and 1200dpi Enhanced Resolution, 36 Bit Enhanced Colour, single pass Hi-Speed colour scanning, USB Interface, Push button control. Bundled Software includes HP PrecisionScan with integrated OmniPage Lite for automatic text OCR (Optical Character Recognition) Scanning. Kit includes USB Cable.



Code	Model
IOHPD017	HP Scanjet 4100
IOHPD001	HP Scanjet 5100

Price
\$295
\$475

Code	Model
IOHPD014	HP Scanjet 6200
IOHPD015	HP Scanjet 6250

Price
\$755
\$955

ALL IN ONE

HP's Multi-functional Device featuring: Plain Paper Fax, 300/600dpi mono Scanning with Sheet Feeder, Laser printer rated at 6ppm, Photocopier, and Telephone Answering Machine Interface for Fax/Phone Switching. Can be used as a Standalone Fax Machine and PhotoCopier or connected to a PC via Single Parallel Cable for use as a Printer and Scanner, Features 20 Pages Feeder for Unattended Faxing or Scanning.

Code	Model	Price
PRHPD023	Officejet 590	\$620
PRHPD033	Officejet 635 5ppm at 600dpi	\$799
PRHPD037	Officejet 1175C 9ppm mono /5ppm colour	\$1765

HP LaserJet 3100
\$1365 PRHPD034



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EXCELLENCE THROUGH INNOVATION

Monitors

3 YEAR ON SITE WARRANTY*

Mitsubishi Diamond View 1554 15"

- Advanced Plug & Play
- Superior image fidelity 0.28 Dot Pitch
- 13.6" True viewabl
- Maximum Resolution 1024x768 up to 65Hz

\$355 MOMIT003



Mitsubishi Diamond View 1772E 17"

- Advanced PnP compatibility
- Superior image fidelity 0.27Dot Pitch
- 15.9" True Viewable
- Maximum Resolution: 1280x1024 up to 60Hz

\$625 MOMIT002



Mitsubishi Diamond Plus 71 17"

- DIAMONDTRON Monitor, with the super-fine aperture grille pitch of 0.25mm Dot Pitch
- 16.0" True viewable
- Maximum Resolution 1280x1024 up to 65Hz

\$910 MOMIT001

pc world
BEST BUY
PC & MAC
Compatible



Mitsubishi Diamond Pro 91TXM 21"

- A new DIAMONDTRON Monitor, with the super-fine aperture grille pitch of 0.28mm Dot Pitch
- Maximum Resolution 1600x1200 at 76Hz
- 19.7" True viewable

\$2999 MOMIT000



Diamond View 1995 19"

\$1295 MOMIT005

High contrast 19" picture tube with 18" viewable.

Flicker free high-resolution images 1600 x 1200 pixels at 75 Hz refresh rate.

5 user selectable and adjustable colour temperatures.



Storage

The new standard in diskette storage.

Code Model

BUMIT000 Mitsubishi LS - 120 - 120MB Capacity.

Mitsubishi LS-120 FACTS:

- Large storage capacity of 120MB in a single LS-120 diskette.
- 100% compatibility with existing 3.5" diskette media
- Supported by MS DOS, Windows (3X, 95, NT)
- Bootable, can act as a Boot Drive when appropriate BIOS installed

BUMIT001 120MB capacity diskettes to suit LS - 120 Drive **\$25**

Code Model Price
FDMIT000 Mitsubishi Diamond Data 1.44MB Floppy disk drive. **\$36**

Code Model new Price
MMMIT003 Mitsubishi Diamond Data 36X CD-ROM **\$95**
MMMIT001 Mitsubishi Diamond Data 40X CD-ROM **\$110**



40x



Price
\$180

Mitsubishi 15" LCD TFT

\$2049

MOMIT004

15" LCD TFT Monitor with the grille pitch of 0.28mm

Maximum Resolution 1024x768

PRICE
DROP



Keyboards

Mitsubishi Diamond Touch Ergonomic Keyboard

\$49 IOMIT001

Mitsubishi Diamond Touch Economical Keyboard

\$30 IOMIT000



Panasonic

Panasonic



Adelong Computers

Panasonic's NEW Digital technology sets the standards for Top performing high-end monitors. All monitors feature true-type colours, excellent focus and convergence, power saving functions and crystal clarity in colour display.

PanaFlat LC50

15" colour monitor with state-of-the-art design creating a slim profile.

Specifications

- 15" flat screen monitor
- 0.297mm dot pitch
- Built in Multimedia Speakers
- On-Screen display controls
- 1024x768 max.res.
- 15" viewable area

\$2375 MOPAN013



PanaSync™ E50i

Excellent Value Multi-Scan Display with Higher Picture Quality and Convenience.

Specifications

- 15" diagonal flat screen
- 0.28mm dot pitch
- Anti-static, Anti-glare coating
- 1024x768 max.res.
- 14" viewable area

\$360 MOPAN008



PanaSync SL70

17" Digital Multiscan colour FST display. The monitor that's very sharp and compact in size.

Specifications

- 17" flat screen monitor
- 0.27mm dot pitch
- Advanced anti-glare, anti-static coating
- On-Screen display controls
- 1280x1024 at 65Hz
- 16" viewable area

\$795 MOPAN003



PanaSync E70

Energy-Saving 17" Display with Automatic frequency selection from 30K - 70kHz.

Specifications

- 17" flat screen monitor
- 0.27mm dot pitch
- Anti-glare, anti-static coating
- On-Screen display controls
- 1280x1024 max.res.
- 16" viewable area

\$659 MOPAN010

PanaSync SL90

19" monitor with a large 18" true viewable area. Super sharp and compact in size.

Specifications

- 19" flat screen monitor
- 0.25mm dot pitch
- Advanced anti-glare, anti-static coating
- On-Screen display controls
- 1600x1200 max.res. at 75Hz
- 18" viewable area

\$1445 MOPAN011



PanaSync S110

The 21" monitor that takes brightness to a new level and places its focus on high image quality.

Specifications

- 21" flat screen monitor
- 0.25mm dot pitch
- Anti-glare, anti-static coating
- On-Screen display controls
- 1600x1200 max.res.
- 20" viewable area

\$2149 MOPAN001

Storage Devices

LS 120 120MB LKM-F434-1

- Large storage cap. of 120MB in a single LS-120 diskette
- 100% compat. with existing 3.5" diskette media
- Supported by MS DOS, Windows (3X, 95, NT)
- Bootable with BIOS



BUPAN000 **\$169**

Panasonic DVD Kit

DVD technology brings a whopping 8 GB of data per disk to your desktop today. Watch the latest DVD titles or play the latest multimedia and games with the Panasonic DVD kit.

new



MMPAN006 **\$375** (DVD Drive & MPEG Decoder)

MMPAN005 **\$295** (DVD DRIVE)

CD Recordable (4Wx8R) CW-7502-BAB

CD-Recordable Drive Kit, 4-speed write/8-speed read bundles with software & SCSI interface

PRICE DROP



MMPAN003 **\$675** (OEM KIT)

MMPAN004 **\$525** (BARE DRIVE)

ZIP Drive JU-811Y01

- 100Mb Capacity (70 FDDs)
- Use with 100MB Zip Disk



BUPAN001 **\$165**

CD ROM 32X CR-588-B

Superfast 32x speed reading, this can also read CDRW disc.



MMPAN002 **\$110**

CD ROM SCSI 24X CR-508-BPA

Panasonic CD508B SCSI 2 CD-Rom drive is one of the best performing drives available. Super fast access time of 85ms and 3600KB/s sustained transfer rate.



MMPAN001 **\$169**

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday
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Sales Hotline 02 8344 3190



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Monitors & Projectors

THREE YEAR on-site warranty!



Hansol 701A

Full featured professionals 17" (15.7 viewable), full square high resolution flat face colour monitor with 0.28 dot pitch.

Specifications:

- Easy to use
- Fully supports Windows 95
- Resolution of 1280 x 1024 at 60Hz(H/V)
- Bandwidth (-3dB) 110MHz
- Microprocessor
- Plug & Play
- Display area of 320 x 240mm
- User control with Power Switch, Reset, Manual Degaussing, Contrast & Brightness
- Power saving (DPMS)
- Standard EMI, Safety, Ergonomics & low rad.

\$635 MOHAN004



Hansol 700P

Full featured professionals 17" (15.7 viewable), full square high resolution flat face colour monitor with 0.26 dot pitch.

Specifications:

- Easy to use
- Fully supports Windows 95
- Resolution of 1400 x 1200 at 66.6Hz(H/V)
- Bandwidth (-3dB) 135MHz
- Microprocessor
- Plug & Play
- Display area of 320 x 240mm
- User control with Power Switch, Reset, Manual Degaussing, Contrast & Brightness, H/V size, Tilt, Colour control
- Power saving (DPMS)
- Standard EMI, Safety, Ergonomics & low rad.

\$735 MOHAN005



Hansol 500A

15" Diagonal colour monitor 280 x 210mm with 0.28 dot pitch.

Specifications:

- Easy to use
- Fully supports Windows 95
- Display area of 280 x 210mm
- Ergonomics and low radiation
- Resolution of 1024 x 768-60Hz
- Standard EMI, Safety,
- Bandwidth 65MHz
- Microprocessor
- Plug & Play

\$345 MOHAN001



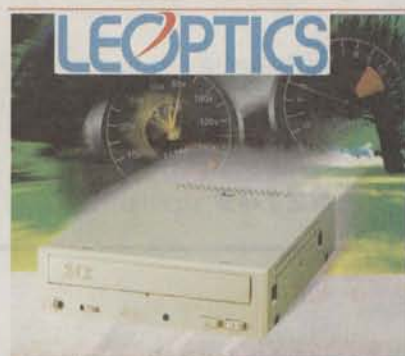
Hansol 500M

15" Diagonal colour monitor 280 x 210mm with 0.28 dot pitch.

Specifications:

- Easy to use
- Fully supports Windows 95
- Display area of 280 x 210mm
- Ergonomics and low radiation
- Resolution of 1024 x 768-60Hz
- Standard EMI, Safety,
- Built in speaker
- Plug & Play

\$385 MOHAN003



CTX

36X CD-ROM Drive

- Intelligent latest advanced technology
- Has a good suspension for vibration control
- Front panel with a direct Audio CD play function button
- Data access speed is powerful--100 msec.

\$95 MMLEQ003

CD-Recordable/Re-Writable Multi-function Disc Drive

- Unique multi-function concept combining 6x CD-ROM reader, 2x CD-Rewritable drive
- IDE/ATAPI interface - no need for costly SCSI adaptors
- Supports TAO (Track At Once), DAO (Disc At Once), MS (Multi-Session), fixed and variable (Incremental Packet) writing modes, as well as CD-DA, CD-ROM (XA), CD-Bridge, Multi-Session, CD-I, Video-CD and CD-UDF disc formats

\$570 MMLEQ002



The EZPro series are the outstanding personal projectors for professionals who take to road for professionals who take to the road for multimedia presentation.

EzPro 585

- Lightweight only 10 pounds
- TRUE 800 x 600 SVGA
- Compatible with MAC, PC & Video source
- 500ANSI lumens brightness
- Comes with remote & Carry Case

\$6699 MMCTX003

EzPro 500

- 6.4" colour TFT LCD Panel
- 16.7" million colours
- 350 ANSI lumens
- 640 x 480
- 400 Watt lamp
- Speaker

\$3575 MMCTX000

EzPro 680

- Portable projector, only 5.5kg
- 1024 x 768 resolution
- 500 ANSI lumens

\$10525 MMCTX002

Call for lease options!

Toshiba

Toshiba LCD Data Projectors

Toshiba LCD Data Projectors answer all your business needs with wide XGA-mode capabilities, excellent image quality and ease of use. Compact and highly portable, you can quickly set them up just about anywhere - from bright environments to large conference halls. Whether using PC, TV or other source materials, Toshiba projectors provide bold, crisp images that make an impression on every member of your audience.



Several advanced features include:

- 600 ANSI lumens provides a high quality image without darkening the room
- PC/MAC Images up to 1024 x 768 and major television (NTSC/PAL/SECAM/DVD/HDTV)
- Screen sizes from 22-inch to 300-inch can be used with the Toshiba projectors
- Wireless Remote Control, Built in Amplifier & Speakers, Worldwide Power source compatibility
- Toshiba G3 has a built-in CCD document imaging camera system. This enables projection of hand-written, printed materials.



G3
\$11695
IOTOS000



G1
\$10875
IOTOS001

Adelony Computers

Moore Music

Digital Audio Hardware and Software



XLERATE **\$399**
MMTUR000

- Real-Mode DOS SoundBlaster and SoundBlasterPro compatible
- DirectSound compatible
- Integrated Wavetable
- A3D Positional 3D-Audio

FIJI by TURTLE BEACH

PROFESSIONAL DIGITAL AUDIO CARD

- Studio-quality audio performance with better than 97db signal-to-noise ratio
- High-resolution, crystal-clear 20-bit stereo converters
- Accepts optional S/PDIF digital I/O interface (24-bit capable) and MIDI synthesizer module
- Supports 32 independent MIDI channels
- Includes award-winning Voyetra software for audio production



Pinnacle Project Studio

\$795
MMTUR001

\$1595
MMPIN000

ZULU

Multichannel external digital audio converter

Zulu is a 4-input/8-output (Tanogo 8in/8out) external digital audio converter for computer-based systems. Zulu combines high-resolution 20-bit A/D and D/A converters with ADAT optical digital I/O for superior audio performance in a truly affordable package. Combining Zulu with an ADAT digital I/O soundcard, such as the Frontier Design Group WaveCenter(tm), eliminates noises that plague other computer soundcards. Since Zulu transfers digital audio data optically and has an independent power supply, it is isolated from all PC-generated noises, protecting sensitive audio signals.

FEATURES:

- 20-bit resolution with 128x oversampling converters
- >98dB S/N ratio, 0.002% THD+N
- Bi-color input level indicators on front panel

- Unbalanced -10dBV signal levels
- Professional 1/4" jacks (compatible with balanced TRS cables without an adaptor)
- ADAT optical in/out
- Rugged, compact half-rackspace enclosure

ZULU & Wave Center was \$2595 NOW **\$1795** MMPIN000

ACID is a breaking loop-based music production tool from Sonic Foundry that brings unprecedented creative flexibility to loop arranging and editing. ACID include a library with hundreds of loops in many different instruments and musical styles:

- Multiple track looping and editing
- Change loop tempo or pitch on the fly
- Automatic matching of loop tempos and pitch

Acid **\$549**
SWACI000

Acid Rock **\$99**
SWACI002

Acid DJ **\$99**
SWACI001

Acid Music **\$199**
SWACI003

Acid Loops Various titles **\$129** SWACI004

samplitude studio

Digital Multitracking Studio

The digital multi-tracking studio. The most powerful audio tool box ever built.

Check out the amazing possibilities available with digital multi-track recording. Simultaneous recording on multiple tracks with the highest audio quality and real-time effects. Professional multi-tracker records, CD Mastering and CD Burning

Samplitude Studio **\$995**

Sales staff are available (est) 9am-6pm Monday to Friday, 10am-4pm Saturday
Technical Support (5 Days a week 9am-6pm) Phone (02) 8344 3160



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*Please read our Terms and Conditions

Sales Hotline 02 8344 3190

D-Link Networking

D-Link

Ethernet Cards

10/100Mbps PCI Fast Ethernet Card

Ensure your future network upgrades are catered for with this 10/100 auto-negotiating network adapter. Plug and Play support for trouble free installation.



\$56

NWDLI002

- | | | |
|----------|---|--------------|
| NWDLI000 | DE-220PCT ISA PnP 10Mbps Ethernet Adapter | \$35 |
| NWDLI001 | DE-220PCT PCI PnP 10Mbps Ethernet Adapter | \$40 |
| NWDLI006 | DE-905 Ethernet Network Kit
(inc. 5-Port Hub, 2 x 10Mbps ISA
Ethernet, 2 x 7 Meter CAT 5 Cable) | \$195 |

56K Fax/Modems

DFM - 560 High Speed Fax/Modems



\$165

NWDLI000

- | | | |
|----------|--------------------|--------------|
| FMDLI001 | 56K Internal Modem | \$135 |
|----------|--------------------|--------------|

Ethernet & Fast Ethernet Switches

For a cost effective solution to improving network performance, D-Link's range of switches Utilizing a switch to segment your network will reduce unwanted network congestion and hence improve its performance.

8 Port 10/100 N-Way Switch DES-1008



Featuring 8 x 10/100 ports, the DES-1008 is ideal for multiply high speed servers or deployment in server farms.

- | | | |
|----------|--|--------------|
| NWDLI011 | DES-810 10 Port Ethernet Switch with 8 x 10Base-T & 2 x 100 BaseTX | \$799 |
|----------|--|--------------|

- | | | |
|----------|--|---------------|
| NWDLI021 | DES-815 12x10Mbps & 3x100Mbps PortSwitch | \$1109 |
|----------|--|---------------|

\$CALL!

NWDLI022

Ethernet PCMCIA Cards



10/100Mbps Fast Ethernet PCMCIA Card

Make the most of your notebook computer by ensuring that it can handle both 10Mbps Ethernet & 100Mbps Fast Ethernet Networks no matter where you go.

\$206

NWDLI013

- | | | |
|----------|--------------------------------------|--------------|
| NWDLI003 | DE-660CT PCMCIA 10Mbps Ethernet Card | \$115 |
|----------|--------------------------------------|--------------|

10 & 100Mbps Ethernet HUBS

8 Port 10/100 N-Way HUB

These hubs provide an easy and cost effective transition to Fast



Ethernet whilst remaining compatible with existing 10Base-T networks. Fully scalable to 80 ports in a 5 port stack. (DFE-908X)

\$685

NWDLI012

- | | | |
|----------|---|---------------|
| NWDLI019 | DFE-916 16 Port 10/100 N-Way Stackable HUB | \$1345 |
| NWDLI020 | DFE-2624 24 Port 10/100 N-Way Stackable HUB | \$1859 |
| NWDLI017 | DE-805TP 5 Port 10Base-T Ethernet Hub | \$99 |
| NWDLI004 | DE-809TP 9 Port 10Base-T Ethernet Hub | \$150 |
| NWDLI005 | DE-816TP 16 Port 10Mbps Hub
- Rack Mountable | \$310 |

Printer Servers

Turn any printer into a network printer through D-Link's range of print servers. Supporting multiple protocols and multiple high speed printer ports, these devices bring a high level of flexibility and performance to printer sharing over a network.

The DP-300 supports 2 x Parallel printers and 1 x Serial printer hence allowing simultaneously connections to as



many as 3 printers whilst reducing demands on network servers. In addition, the print server can connect to your network via any 10Mbps or 100Mbps port.

- | | | |
|----------|---|--------------|
| NWDLI023 | DP-101 1 Port Pocket Size Ethernet Print Server | \$299 |
|----------|---|--------------|

\$429

NWDLI015

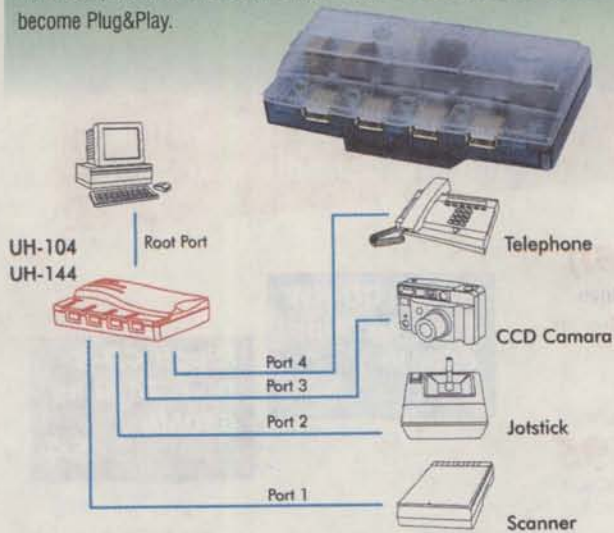
Data Switches



Adelong Computers

UNIVERSAL SERIAL BUS (USB) HUB

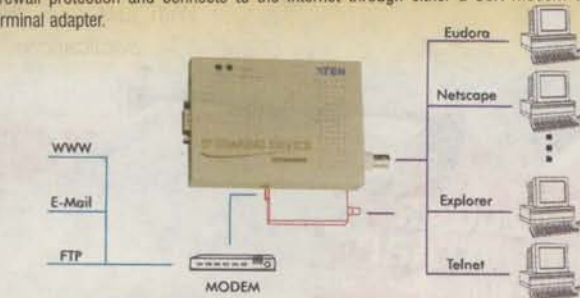
While most PCs will only support 2 USB ports, the UH-144 can support up to 4 devices with the option to daisy chain. It supports both full speed (12Mbps) and low speed devices such as keyboards and joysticks. No more complications with DMA & IRQ conflicts, with USB your devices become Plug&Play.



DSADE039 **\$85**

IP SHARING DEVICE

Wish everybody on your network had Internet Access but not the high costs and complexity associated with multiple accounts. If this is you, then the IS-100 IP Sharing Device is for you. By using a single Internet account with the IS-100, your whole network can have Internet Access simultaneously. The IS-100 can also act as a DHCP server and offer Firewall protection and connects to the Internet through either a 56K modem or ISDN terminal adapter.



DSADE040 **\$249**

USB TO IEEE-1284 BRIDGE

Connect your printer to your PC's USB Host controller with ease. Transparent and full automatic support for true bi-directional communication between your computer and your printer with no conflicts or installation hassles. Free up your parallel for other devices such as ZIP drives, Scanners and CD-ROMs by moving your printer to a USB port today!



DSADE041 **\$45**

Cases & APC UPS

ADE FILE SERVER CASE AT/ATX

Features

- 2 x 300W Redundant Power Supplies
- 7 x 5 1/4" & 2 x 3 1/2" Bays

CAADE013 **\$975**

ADE DELUXE ATX MID CASE

W: 190mm
D: 425mm
H: 475mm

CAADE009

\$135

HOT

ADE DELUXE AT/ATX MID CASE

W: 192mm
D: 430mm
H: 540mm

CAADE004

\$155

ADE DELUXE AT/ATX DESKTOP CASE

W: 442mm
D: 473mm
H: 155mm

CAADE012 **\$135**

Power Supplies

Code	Model	Price	Code	Model	Price
PSGEN000	200W AT POWER SUPPLY	\$35	PSGEN003	300W ATX POWER SUPPLY	\$99
PSGEN002	200W ATX POWER SUPPLY	\$55			

APC "Industry standard reliable & affordable backup power solution"

Back-UPS - Best Value power protection for your PC

- Compact Design
- Protect your PC, Monitor, Laser printer with 1 device
- Full-time EMI/RFI filters for noise filtration
- Lightning and surge suppression to protect your hardware
- Support for up to 4 Devices

Code	Description	Price
PSAPC008	Back-UPS 300VA	\$195
PSAPC000	Back-UPS 500VA	\$285
PSAPC009	Back-UPS 650VA	\$380

Smart-UPS - Power Management for advanced networks

- Site-wiring fault indicator
- Full-time Surge Suppression and Noise Isolation
- User replaceable, hot swappable batteries
- Software configurable features, data logging on 1000/700 model



Code	Description	Price
PSAPC010	Smart-UPS 420VA	\$509
PSAPC011	Smart-UPS 650VA	\$650
PSAPC003	Smart-UPS 700VA	\$970
PSAPC005	Smart-UPS 1000VA	\$1275

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Sales Hotline 02 8344 3190



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CD Writers

RICOH

A single drive that does it all.

Reads, writes, Rewrites CD data.

The Ricoh MP6200 series drives have multi-function capabilities so they can efficiently handle any CD-based media from the world's first re-writable CD, Ricoh's CD-RW, to the write-once CD-R and CD-Rom. With just one drive, you can always choose the perfect media to suit your applications. Now supporting random access writing.



MP6200AR (EIDE) ATAPI

Internal EIDE CD-R/CD-RW Drive Direct CD Ver. 2.0, Easy CD Creator 95/NT, 1 CD-R Disc, 1 CD-RW Disc Operation Manual, Audio Cable, Mounting Screws

Kit includes \$35 of Media products

\$599
MMRIC001

MP6200SR (SCSI)

Internal SCSI CD-R/CD-RW Drive Direct CD Ver. 2.0, Easy CD Creator 95/NT 4 CD-R Disc, 1 CD-RW Disc Operation Manual, Audio Cable, Mounting Screws

\$695
MMRIC000

Ricoh CD-RW Disc 74 Mins 650Mb
MMRIC003 **\$35**

Ricoh CD-R Disc 74 Mins 650Mb
MMRIC004 **\$4**

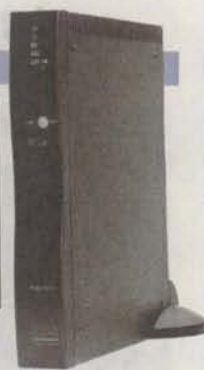
Fast writing and reading 6x read 2x write, CD-RW and CD-R writing, unlimited media selection

UPS & Line Filters

Information stored on computers and distributed via the computer network is of vital importance for a small business. MGE UPS SYSTEMS is the first UPS manufacturer to design a range of UPS that meet the specific requirements and restrictions of small business staff and management: the price is reasonable and the package is easy to install and use.

	ES2+	ES5+	ES8+	ES11+
Power	220VA	480VA	780VA	1080VA
No DF power output	2	2	4	4
Fax/Modem line			✓	✓
Backup time for PC	5 min	23 min	44 min	78 min
Price	\$349	\$435	\$679	\$1025

ES + series for a total and manageable protection system Plug and Play compatible, the solution - PAC 97-power management software games a powerful GUI interface to control features such as remove management and shutdown of multiply service.



	EL2	EL4	EL7
Power	220VA	450VA	750VA
No of power outputs	2	2	4
Fax/Modem Line			✓
Backup time for a PC	5 min	20 min	40 min
Price	\$259	\$335	\$Call

Perfect for the Soho, the EL Series offers affordable protection for your equipment.

Power Filter

- Powercor premium grade AC power filter technology to reduce surge/spike and transient damage.
- Power grid comes with 4 individually wired plugs.

Code Model
PSGEN004 ZAPTRAP - Multistage filter
PSGEN005 ZAPCATCHER - Multistage filter with Telecom line surge protection



Price
\$140
\$150



CD-Writers & ReWriters



Adelong Computers

TRAXDATA



the biggest CD data-storage brand on the Planet!

Purchase any Traxdata product and you will go into the draw to win the sports car of your dreams or 14 consolation prizes of the latest DVD Players!

- Easy to use
- Easy to install
- Affordable
- Make your own high quality CDs



CD-Recordable Driver CDE4120 EL PRO

- 4x/12x **SCSI** Recorder
- WinonCD 3.5 CD Mastering Software (OEM version)
- Packet CD UDF Recording Software for Win95®
- 2x Traxdata CD-R Discs & Marker Pen
- Manuals

MMTRA002 **\$699*** (Int.)

MMTRA003 **\$975*** (Ext.)



PressIT CD Labelling Kit

PressIT CD Labelling Kit uses a clever yet simple design, allowing you to put professional looking labels on your CDs. This neat and compact labelling system provides the perfect answer to all those CD labelling task which up to now have been a real hassle.

\$75 MMTRA020

*add \$100 to include Ultra SCSI Adaptor
1.2GB Data Storage Capacity for all recorder kits

For PCI Bus

SCSI card kit

\$139

MMTRA006



Other Items

Code	Model	Price
MMTRA007	BLANK CD-R	\$3.50
MMTRA008	BLANK CD-RW	\$29
SWTRA007	WinonCD Pro V3.5	\$185



Re-Writable Driver CDRW2260 EL PRO

2x Record/2x Erase/6x Playback **SCSI** Recorders packed complete with:

- WinonCD 3.5 CD Mastering Software (OEM version)
- Packet CD UDF Recording Software for Win95®
- CD Marker Pen
- Manuals

MMTRA016 **\$645*** (Int.)



Re-Writable Driver CDRW2260 EL PLUS

2x Record/2x Erase/6x Playback **IDE** Recorders packed complete with:

- WinonCD 3.5 CD Mastering Software (OEM version)
- Packet CD UDF Recording Software for Win95®
- Cable
- CD Marker Pen
- Manuals

MMTRA004 **\$549** (Int.)

MMTRA018 **\$670** (Ext.Parallel)



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Technical Support (5 Days a week 9am-6pm) Phone (02) 8344 3160



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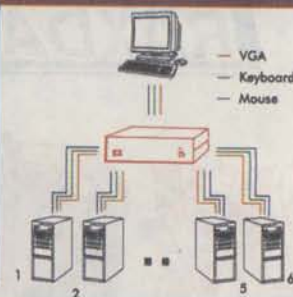
Sales Hotline 02 8344 3190

Data Switches

Auto CPU Switch Box

A CPU switch allows a user to control multiple computers with the ease of using a single console. That is, a single keyboard, mouse and monitor can control up to 8 computers simultaneously. A perfect partner for network administrators or the enthusiast with two or more computers.

- Supports Mouse emulation and keyboard emulation for automatic PC bootup
- Provides Serial & keyboard interfaces
- Supports VGA, SVGA & Multisync monitors
- Three level cascading for easy expansion
- LEDs give current mode status



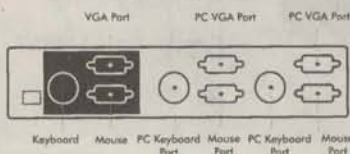
CS-102

Control up to 2 PCS with the entry level CS102

DSADE030 **\$245**

AT

CS-102 REAR VIEW



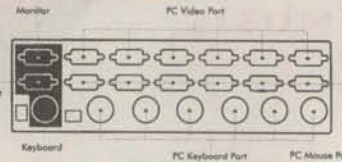
CS-106

Perfect for those managing several PCs. Auto scanning for monitoring PCs periodically

DSADE020 **\$399**

AT

CS-106 & CS-106M REAR VIEW



CS-122

Supports both PS/2 and AT Style computers transparently

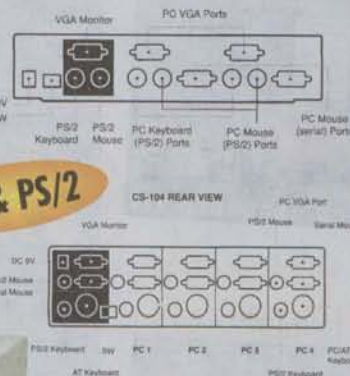
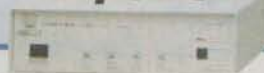
DSADE037 **\$275**

AT & PS/2

CS-104

CS - 104 4 Port Switch Box

DSADE019 **\$395**



CS-128

8 Port Switch Box

DSADE036 **\$695**

AT & PS/2



Item Code Description

CBGEN127 AT CABLE SET for CS-128

CBGEN128 PS/2 CABLE SET FOR CS-128

Price
\$39
\$39

Special Shielded Cables For CPU Switches

CBGEN098 AT CABLE SET

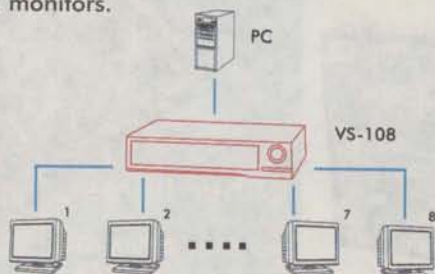
\$35

CBGEN099 PS/2 CABLE SET

\$39

Video Splitters

Video splitters are fast, flexible solutions for broadcasting video information to the public. They enhance video signals for long distance broadcasting. Great for presentations and demos, they allow 1 computer to hook up to several monitors.



CBGEN035 1.8M VGA Monitor Cable M/M

\$9

VS-102 2 Port Video Splitter

DSADE000 **\$95**

VS-104 4 Port Video Splitter

DSADE001 **\$135**

VS-108 8 Port Video Splitter

DSADE002 **\$195**



Cables



Adelung Computers

USB CABLES

Item Code	Description	Price
CB-GEN155	1M USB CABLE A	\$15.00
CB-GEN156	1M USB CABLE B	\$15.00

PRINTER CABLES

CB-GEN000	6FT PRINTER CABLE	\$5.00
CB-GEN002	5 METERS PRINTER CABLE	\$12.00
CB-GEN003	10 METERS PRINTER CABLE	\$19.00
CB-GEN089	1.8M IEEE 1284 PRINTER CABLE	\$19.00

SERIAL CABLES

CB-GEN042	1M CENT50M TO CENT50M SCSI	\$15.00
CB-GEN043	1.8M CENT 50M CENT 50M SCSI	\$17.00
CB-GEN044	1M CENT 50M/DB25M SCSI	\$15.00
CB-GEN047	1M HONDA 50M/CENT 50M	\$25.00
CB-GEN048	1.8M HONDA50M/CENT50M	\$29.00
CB-GEN049	1M HONDA 50M/HONDA 50M	\$39.00
CB-GEN051	1M HONDA 68M/HONDA 68M	\$45.00
CB-GEN052	1M HONDA 68M/HON 50M	\$45.00
CB-GEN053	1M HOND A 68M/CENT 50M	\$45.00
CB-GEN083	HONDA 68 TO DB25 M SCSI III	\$45.00
CB-GEN057	INTERNAL SCSI III	\$85.00
CB-GEN060	INT SCSI CABLE 7 CONNECT	\$15.00

KEYBOARD & VGA CABLES

CB-GEN023	1.8M KEYBOARD EXT M/F	\$9.00
CB-GEN025	5M KEYBOARD EXT M/F	\$15.00
CB-GEN027	1.8M PS/2 KB EXT M/F	\$12.00
CB-GEN028	1.8M PS/2 KEYBOARD M/M	\$12.00
CB-GEN029	1.8M KEYBOARD CABLE M/M	\$10.00
CB-GEN030	1.8M EGA/MOUSE EXT 9F/9M	\$9.00
CB-GEN031	1.8M EGA/MOUSE 9M/9M	\$9.00
CB-GEN032	1.8M VGA EXT 15M/15F	\$9.00
CB-GEN036	MONITOR SPLITTER 15M/15F*2	\$15.00
CB-GEN037	1.8M RGB CABLE 15M/BNC*5	\$25.00

SCSI ADAPTERS

CB-GEN042	1M CENT50M TO CENT50M SCSI	\$15.00
CB-GEN043	1.8M CENT 50M CENT 50M SCSI	\$17.00
CB-GEN044	1M CENT 50M/DB25M SCSI	\$15.00
CB-GEN047	1M HONDA 50M/CENT 50M	\$25.00
CB-GEN048	1.8M HONDA50M/CENT50M	\$29.00
CB-GEN049	1M HONDA 50M/HONDA 50M	\$39.00
CB-GEN051	1M HONDA 68M/HONDA 68M	\$45.00
CB-GEN052	1M HONDA 68M/HON 50M	\$45.00
CB-GEN053	1M HOND A 68M/CENT 50M	\$45.00
CB-GEN083	HONDA 68 TO DB25 M SCSI III	\$45.00
CB-GEN057	INTERNAL SCSI III	\$85.00
CB-GEN060	INT SCSI CABLE 7 CONNECT	\$15.00

SCSI ADAPTERS

Item Code	Description	Price
CB-GEN131	HONDA50F/CENT50M	\$30.00
CB-GEN132	HONDA50M/CENT50F	\$25.00
CB-GEN133	HONDA50F/CENT50F	\$32.00
CB-GEN134	HONDA50F/DB25M	\$25.00
CB-GEN135	GENDER CHANGER CEN50 F/F	\$12.00
CB-GEN136	HONDA68M/CEN50F	\$35.00
CB-GEN137	HONDA68F/CEN50M	\$38.00
CB-GEN138	HONDA68M/HONDA50F	\$39.00
CB-GEN139	HONDA68F/HONDA50F	\$40.00
CB-GEN140	HONDA68M/HONDA68F	\$45.00
CB-GEN141	HONDA68F/HONDA68F	\$45.00
CB-GEN149	INT. SCSI 50F/68F	\$30.00
CB-GEN143	INT. SCSI 50F/68M	\$30.00
CB-GEN144	INT. SCSI 50M/68F	\$20.00
CB-GEN145	INT. SCSI 50M/68M	\$20.00
CB-GEN146	INT. SCSI 50M/50F BRACKET ADAPTER	\$20.00
CB-GEN147	INT. SCSI 50M/68F BRACKET ADAPTER	\$25.00
CB-GEN148	INT. SCSI 50M/DB25 BRACKET ADAPTER	\$20.00
CB-GEN150	INT. SCSI 68F/68F BRACKET ADAPTER	\$35.00

NETWORKING

CB-GEN065	5M COAXIAL CABLE WITH BNC	\$12.00
CB-GEN066	10M COAXIAL CABLE WITH BNC	\$15.00
CB-GEN067	20M COAXIAL CABLE WITH BNC	\$20.00
CB-GEN070	BNC TERMINATOR	\$3.50
CB-GEN071	BNC T CONNECTOR	\$3.50
CB-GEN073	2M RJ45 CABLE	\$10.00
CB-GEN074	5M RJ45 CABLE	\$15.00
CB-GEN076	10M RJ45 CABLE	\$20.00
CB-GEN078	20M RJ45 CABLE	\$30.00
CB-GEN081	40M RJ45 CABLE	\$59.00
CB-GEN084	2 METRE RJ45 CABLE-CROSS	\$12.00
CB-GEN087	10 METRE RJ45 CABLE-CROSS	\$25.00

PARALLEL

CBGEN038	1.8M PARA LAPLINK DB25M/M	\$12.00
CBGEN039	5M PARA LAPLINK DB25M/M	\$15.00
CBGEN040	10M LAPLINK PAR DB25M/M	\$19.00

POWER & I/O

CBGEN058	FLOPPY CABLES	\$6.00
CBGEN059	IDE CABLE 3 CONNECT	\$6.00
CBGEN061	INTERNAL POWER SPLITTER	\$5.00
CBGEN062	1.8M WALL TO PC POWER CABLE	\$6.00
CBGEN063	1.8M PC TO MONITOR POWER CABLE	\$7.00

SCSI TERMINATORS

CB-GEN045	CENT 50M SCSI TERM ACTIVE	\$25.00
CB-GEN046	CENT 50M TERM/C50M/C50F	\$19.00
CB-GEN054	HONDA 50M TERMINATOR ACT	\$25.00
CB-GEN055	HONDA 68M TERMINATOR ACT	\$39.00
CB-GEN056	INTERNAL TERMINATOR ACT	\$20.00



PS/2



RJ 45



BNC



serial mouse



Centronics 50



Honda 68



Honda 50

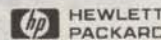


DB 25

Ink & Toner

Canon

Code	Description	Printer compatibility	Price
INCAN000	BC01 BLACK	BJ10/20	\$45
INCAN001	BC02 BLACK	BJ200/BJ210/BJ240	\$45
INCAN002	BC05 COLOUR	BJ210/240	\$49
INCAN003	BC06 PHOTO COLOUR	BJ240	\$49
INCAN004	BC06 PHOTO COLOUR KIT	BJ240	\$65
INCAN005	BC09F FLURO COLOUR	BJ210/BJ240	\$79
INCAN006	BC10 BLACK & HEAD	BJ30/BJ70	\$55
INCAN007	BC1-10 BLACK	BJ30/70	\$25
INCAN008	BC11 COLOUR & HEAD	BJ70	\$65
INCAN009	BC1-11 BLACK (3 PK)	BJ70	\$25
INCAN010	BC1-11C COLOUR (3 PK)	BJ70	\$35
INCAN011	BC20 BLACK & HEAD	BJ4000 SERIES	\$49
INCAN012	BC21 COLOUR & BLACK	BJ4000 SERIES	\$79
INCAN013	BC121 BLACK	BJ4000 SERIES	\$14
INCAN014	BC121C TRI-COLOUR	BJ4000 SERIES	\$29
INCAN015	BC22 PHOTO	BJ4200/BJ4500	\$75
INCAN016	BC22 PHOTO KIT	BJ4200/BJ4500	\$95
INCAN017	BC29F FLURO COLOUR	BJ4000 SERIES	\$75
INCAN018	BJI201B BLACK	BJ600 SERIES	\$25
INCAN019	BJI201C CYAN	BJ600 SERIES	\$15.50
INCAN020	BJI201M MAGENTA	BJ600 SERIES	\$15.50
INCAN021	BJI201Y YELLOW	BJ600 SERIES	\$15.50
INCAN022	BJI642 BLACK	BJ300/330	\$29
INCAN023	BJI643 BLACK	BJ800/880	\$45
INCAN024	BJI643C CYAN	BJ800/880	\$49
INCAN025	BJI643M MAGENTA	BJ800/880	\$49
INCAN026	BJI643Y YELLOW	BJ800/880	\$49
INCAN027	BJI801 BLACK	BJ80	\$39
INCAN028	BC03 BLACK	BJ210SP	\$45
INCAN029	BC60 BLACK	BJC7000	\$59
INCAN030	BC61 COLOUR	BJC7000	\$69
INCAN031	BC62 PHOTO COLOUR	BJC7000	\$95



HEWLETT
PACKARD

Code	Description	Printer compatibility	Price
INHPD000	HP51633M BLACK	HP PORTABLE	\$49
INHPD001	HP51626A BLACK	HP 500 SERIES	\$49
INHPD002	HP51629A BLACK	HP 600 SERIES	\$55
INHPD003	HP51645A BLACK	HP850C/1600	\$50
INHPD004	HP51640A BLACK	DJ 1200 SERIES	\$50
INHPD005	HP51606A BLACK	HP PAINTJET XL	\$55
INHPD006	HP51639A BLACK	PAINTJET XL300	\$39
INHPD007	HP51625A COLOUR	DJ500 SERIES	\$49
INHPD008	HP51649A COLOUR	HP 600 SERIES	\$55
INHPD009	HP51641A COLOUR	HP850C	\$55
INHPD010	HP51640C CYAN	DJ1200/1600	\$55
INHPD011	HP51640M MAGENTA	DJ1200/1600	\$55
INHPD012	HP51640Y YELLOW	DJ1200/1600	\$55
INHPD013	HP COLOUR PHOTO KIT	HP690C	\$79
INHPD014	HP 16A PHOTO INK	HP690/692/693	\$59
INHPD022	HPC1823A COLOUR	HP720/890/1120	\$59

EPSON

Code	Description	Printer compatibility	Price
INEPS003	SO20025 BLACK	400/800/1000	\$35
INEPS004	SO20034 BLACK	COLOUR/PRO/PROXL	\$45
INEPS005	SO20036 COLOUR	COLOUR/PRO/PROXL	\$85
INEPS006	SO20047 BLACK	200/820/II/IIIS	\$35
INEPS007	SO20049 COLOUR	II/IIIS/820/1500	\$45
INEPS008	SO20062 BLACK	STYLUS 1500	\$65
INEPS009	SO20066 COLOUR	STYLUS PRO XL+	\$95
INEPS010	SO20089 COLOUR	400/600/800/1520	\$45
INEPS011	SO20093 BLACK	C400/500/600	\$35
INEPS012	SO20097 COLOUR	C500/200	\$45
INEPS013	SO20108 BLACK	C800/1520	\$45
INEPS014	SO20110 PHOTOCOLOUR	PHOTO 700/EX	\$40
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TOHPD001	HP92274A	HP 4L/4ML/4P/4MP	\$125
TOHPD002	HP-C3906A	HP LASERJET 5L/6L	\$105
TOHPD003	HP92275A	HP IIP/IIIP/IIIP+	\$149
Code	Description	Printer compatibility	Price
TOHPD004	HP92291A	HP 4SI/4SI MX/3SI	\$220
TOHPD005	HP-C3900A	HP 5SI/5SI MX	\$325
TOHPD006	HP92298Z	HP 4/4M/5/5N/5M	\$165
TOHPD007	HP-C3900A	HP 4V/4MV	\$275
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2. Operating System
3. Applications
4. User Data
5. Data Exchange

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SWGRE002

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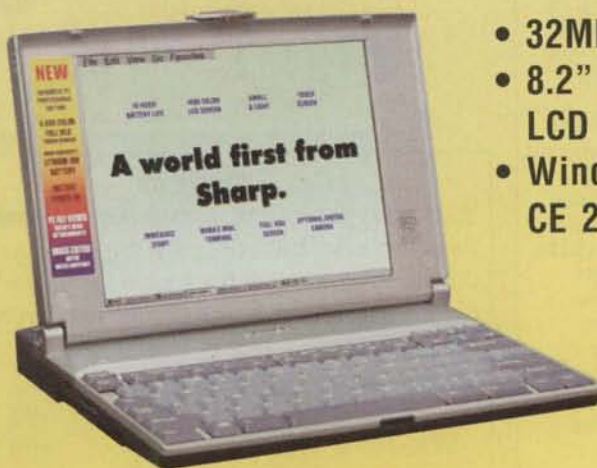
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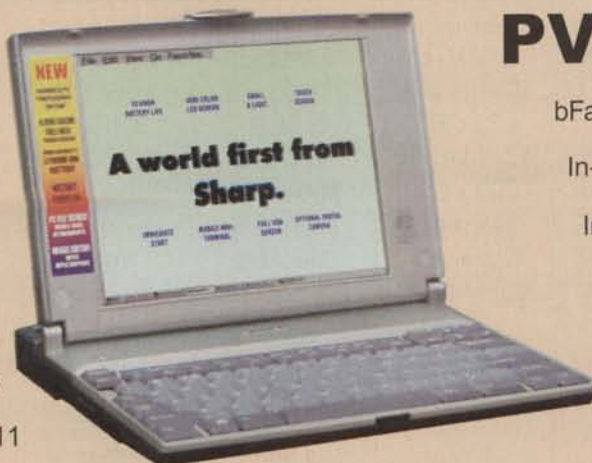
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(62669)

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PCA150

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port
replicator II
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(51747)

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Toshiba Notebook Models

* Harris TechnoRent rental plan subject To Approved Purchasers. Rental figures shown are for 36 month terms. Please call us for latest figures.

	Satellite 2520CDT	Satellite 4000CDS	Satellite 4000CDT	Satellite 4010CDT	Portégé 3010CT	Portégé 7010CT
Processor	AMD K6-2 300MHz MMX	Pentium II 233MHz	Pentium II 233MHz	Pentium II 266MHz	Pentium 266MHz MMX	Pentium II 300MHz
RAM Std/Max	64 MB	32/160 MB	32/160 MB	32/160 MB	32/96 MB	32/160 MB
Hard Disk	4GB	3.8GB	3.8GB	3.8GB	4.1GB	4.1GB
Screen	12.1" TFT	12.1" DSTN	12.1" TFT	12.1" TFT	10.4" TFT	12.1" TFT
Display	800 x 600	800 x 600	800 x 600	800 x 600	800 x 600	800 x 600
CD-ROM	24x max.	24x max.	24x max.	24x max.	No	No
Mic & Spkr	Speakers	Speakers	Speakers	Yes	Yes	Yes
Battery Life	3+ hours	2.5+ hours	2.5+ hours	2.5+ hours	2.6+ hours	2.7+ hours
Port replicator	No	No	No	No	No	Optional
Select bay	No	No	No	No	PRICE DROP No	No
DVD capable	No	No	No	No	No	Yes
Weight	3 kg	3 kg	3 kg	3.1 kg	1.3 kg	1.9 kg
Warranty	1 Year	1 Year	1 Year	1 Year	1 Years	3 Years
Rent 3 Yrs.**	\$26.86/wk*	\$24.89/wk*	\$29.57/wk*	\$32.62/wk*	\$27.17/wk*	\$55.82/wk*
Inc Tax	\$3,450	\$3,198	\$3,799	\$4,190	\$3,490	\$7,390
Part number	NEW !!	(69773)	(69774)	(70737)	(70734)	(69849)

★★★ For RENTAL details see back page ★★★

	Tecra 8000 233	Tecra 8000 233	Tecra 8000 266	Tecra 8000 300
Processor	Pentium II 233MHz	Pentium II 233MHz	Pentium II 266MHz	Pentium II 300MHz
RAM Std/Max	32/256 MB	32/256 MB	64/256 MB	64/256 MB
Hard Disk	3.8GB	3.8GB	6GB	7.6GB
Screen	12.1" DSTN	12.1" TFT	13.3" TFT	14.1" TFT
Display	800 x 600	800 x 600	1024 x 768	1024 x 768
CD-ROM	24x max.	24x max.	24x max.	24x max.
Mic & Spkr	Yes	Yes	Yes	Yes
Battery Life	3.5+ hours	3.5+ hours	3.5+ hours	3.5+ hours
Port replicator	Optional	Optional	Optional	Optional
Select bay	Yes	Yes	Yes	Yes
DVD capable	Yes	PRICE DROP Yes	PRICE DROP Yes	PRICE DROP Yes
Weight	3 kg	3 kg	3 kg	2.9 kg
Warranty	3 Years	3 Years	3 Years	3 Years
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(70734)

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(48527)

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For 220, 300, 310, 440, 460, 480

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For 300, 310, 490, 530, 550, 650, 660, 750, 780

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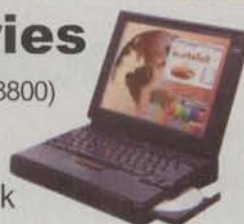
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Black
Scrollpoint
Mouse

(53323)

\$58

5.1GB ThinkPad
770 IDE

Hard
Disk
Drive:
11J8947

(51954)

\$1,895

IBM Thinkpad 390 Series

Part #	Model	Proc	HDD	RAM	O.s.	Screen	\$\$
(20760)	2626-20M	P233MHz	3.2GB	32MB	Win98	12.1" TFT	\$3,490
(41710)	2626-50M	PII233MHz	3.2GB	32MB	Win98	12.1" TFT	\$3,960

IBM Thinkpad 600 45A

\$6,995

(70193)

Rent* T.A.P.**
for **\$52.84**
per week



- Powerful Intel Pentium® II 300MHz processor
- Bright 13.3inch display - TFT
- High capacity 5.1GB Hard disk drives
- Fast 24x - 10x CD-ROM Drive
- 64MB SDRAM
- 16-bit SoundBlaster-compatible stereo audio
- Microsoft Windows® 98

*Rental rate for business use, includes stamp duty and FID for NSW.
Enquire for slight variations in other states. T.A.P.**

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Computing Power & Portability

IBM ThinkPad 560Z Series



Ultraportability without compromise. The award-winning ThinkPad 560 notebooks are super-slim, lightweight and packed with the performance features our customers demand in a ThinkPad notebook.

- Mobile Pentium II 300MHz, L1 internal CPU cache 32KB, 512KB External
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- 6.4GB EIDE Hard Disk Drive
- 800x600 TFT - active matrix screen, 12.1 Inches
- NeoMagic NM2160, 128-bit, 2MB VRAM Graphics Card
- Headphone jack, Microphone (integrated), Microphone jack, Sound Blaster Pro Audio support, Speaker (integrated), Video acceleration, Volume control
- Crystal Semiconductor CS4237B Audio, 16-bit, One integrated speaker

Rent* T.A.P.** FOR **\$43.05** per week

\$5,699

(65731)

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IBM ThinkPad 600 55A Series



With the ThinkPad 600, IBM has assembled the perfect balance of mobile computing power and portability. The ThinkPad 600 delivers award winning ThinkPad technology, vibrant mobile multimedia, easy connectivity and UltraslimBay flexibility, as well as simple, super-portable convenience.

- Mobile Pentium II with AGP 300MHz
- Memory 64 MB standard, upgradeable to 288 MB
- 6.4GB Hard Disk Drive
- 13.3" 1024x768 TFT - Active Matrix screen
- Microsoft Windows 98

\$7,399

(71066)

Rent* T.A.P.** FOR **\$55.85** per week

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\$20

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IBM Options

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\$45

(49847)

Black 104 Key Keyboard

\$94

(34331)

CD-ROM Pouch

\$20

(31991)

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IBM PC300GL Desktops

IBM PC300GL CeleronA300MHz-6287-15A



- Memory (RAM) std/max: 32MB / 256MB SDRAM
- RAM slots total (available): 2 DIMMS (1 DIMMS)
- Hard disk size1: 3.2GB ATA-33
- Pointing device type: PS/2 compatible
- Standard diskette size: 3.5" 1.44MB
- Keyboard type standard: Standard 104 key (rubber dome)
- Expansion ports: Display, Keyboard, Mouse
- **CD-Rom Optional**

\$1,769 (70525)

\$2,175

with Monitor (70525 + 47189)

Rent* T.A.P.** for **\$16.93** per week with monitor

IBM PC300GL Celeron333MHz - 6387-21A



- Celeron 333MHz
- Ram Standard/Max: 32MB/256MB
- Hard Disk Size: 3.2GB (Ultra ATA with S.M.A.R.T.)
- Graphics Chipset: S3 Trio3D AGP, 2 MB
- Operating System: Microsoft Windows 98
- Ram Slots Available: 4x2
- **Cd-Rom Optional**
- Audio Optional

\$1,890 (72297)

\$2,297

with Monitor (72297 + 47189)

Rent* T.A.P.** for **\$17.88** per week with monitor

IBM PC300GL PII450MHz - 6275-73A



- Processor (CPU) : Pentium II 450MHz
- Memory (RAM) std/max : 64MB / 384MB
- Hard disk: 6.4GB ATA-33
- Graphics chipset: S3 Trio3D SVGA
- Pointing device type: PS/2 compatible
- Standard diskette size: 3.5" 1.44MB
- Keyboard type standard: Standard 104 key (rubber dome)

\$2,939 (69393)

Rent* T.A.P.** for **\$22.88** per week

\$3,346

with Monitor (69393 + 47189)

Rent* T.A.P.** for **\$26.05** per week with monitor

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IBM Netfinity File Servers

Netfinity⁵⁰⁰⁰ File Server

From.....

\$6,569



(69403)

Tower Model Pictured

- Intel Pentium II 350MHz MMX Processor with 512Kb Cache
- 64Mb 100Mhz ECC SDRAM with Max 1Gb
- 2 of 2 PCI/ISA Slots Free, 3 of 3 PCI Slots Free
- Dual Channel Wide Ultra SCSI Disk Controller (SCSI-3 on planar)
- Integrated-Ethernet 10/100 Network Interface
- 32X Max CD-Rom Disk Drive
- 16-Bit PCI Graphics Card with 1Mb SGRAM
- Installed operating system Optional
- Enhanced 2 Button Mouse
- 3.5" 1.44Mb Diskette Drive
- Basic 101 Key Keyboard

Processor	IBM #	Part #	\$	Type
PII 350Mhz	865912Y	69403	6,569	Tower
PII 350MHz	96591SY	69404	6,984	Rack
PII 400MHz	865922Y	69405	6,856	Tower
PII 400MHz	86592SY	69406	7,338	Rack
PII 450MHz	865931Y	69407	7,499	Tower
PII 450MHz	86593RY	69408	7,987	Rack

Netfinity features

The Netfinity Servers ship complete with keyboard, mouse and NIC. The 5500 has Integrated RAID support for 0, 1 or 5. 3 year limited on-site warranty.

Netfinity options

IBM
Ultrawide
SCSI HDD
Hot-Swap
4.51GB

\$1,649

(49682)

9.1GB

\$3,350

(65982)

IBM
12/24GB
DAT Tape
Backup

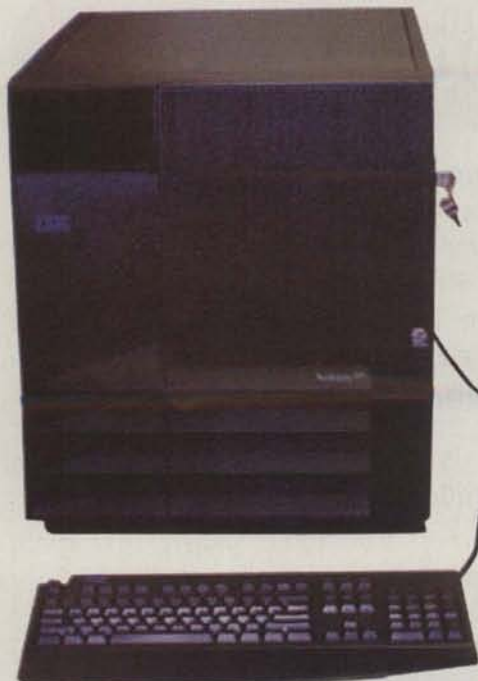
\$2,499

(52388)

Netfinity⁵⁵⁰⁰ File Server

\$10,938

(62174)



- 400MHz Pentium II processor with 512KB ECC L2 Cache
1 or 2 processors, upgradeable to Pentium® II Xeon
- 128MB RAM standard, maximum 1GB
- Dual Channel Wide Ultra SCSI RAID (IBM ServeRAID II on planar) and EIDE (on planar), 0MB installed.
- Maximum storage capacity: 54.6GB
- 6 x 32bit, full size, PCI slots (4 hot swap) 1 x F.S. ISA
- CD-ROM 32X maximum
- Other features: Dial-in for control/monitoring/remote management (Modem required).
- Temperature and voltage monitoring

Processor	IBM #	Part #	\$	Type
PII 350MHz	866011U	62172	10,555	Tower
PII 350MHz	86601RU	62173	10,899	Rack
PII 400MHz	866041U	62174	10,938	Tower
PII 400Mhz	86604RU	62175	11,285	Rack
PII 450MHz	866051U	69409	11,745	Tower
PII 450MHz	86605RU	69410	11,745	Rack

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COMPAQ

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Presario Notebook Computers

Compaq Armada 1575 Notebook

\$2,998

(23358)

Rent* for **\$23.34**
per week, T.A.P.

266MHz MMX
CPU

32MB RAM

(Expandable to 96MB)

12.1" CSTN Display

800 x 600 Resolution

Integrated
AC Adapter

512KB
Cache

Li-Ion
Battery

3.2GB Hard
Disk Drive

20x
CD-ROM



The Compaq Armada 1575D is a fully integrated, convenient portable notebook that offers the best of the Armada 1500 family at a very affordable price!

The ideal Armada model for business as well as education, the Armada 1575D comes with the integrated AC Adapter for convenience and portability and is fully network tested.

* Rental rate for business use, includes stamp duty and FID for NSW. T.A.P.

Please see the Web Direct Link or call us for pricing and availability of RAM upgrades for any Compaq Notebook

Armada 1700 models are available in 233,266 & 300MHz Also, Windows 95 or Windows NT options available See Web Direct for all options

Armada 1700 Notebooks



(65049)

Intel
Pentium® II

233MHz

32MB RAM

4GB HDD

Features the same "All-in-one" functionality you've come to expect from a Compaq Armada Notebook.

Intel Pentium® II CPU 233MHz, 12.1" Active TFT screen with 64-bit graphics accelerator, 32MB SDRAM expandable to 160MB, 4GB SMART HDD, integrated FDD, HDD, 24x CD-ROM, AC Adapter and 56KFlex Data Fax Modem (upgradeable to V.90).

\$4,388

Rent* for **\$23.34**
per week, T.A.P.

Also available :
266MHz model
13.3" TFT screen



(65047)

\$5,669

Rent* for **\$23.34**
per week, T.A.P.

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Compaq Desktops & Servers

COMPAQ Deskpro EP



70281 + 61132

- Intel Celeron™ "A" 300MHz CPU
- 128KB L2 Cache
- 32MB SDRAM (256 Max)
- 4.3GB S.M.A.R.T. Hard Disk
- 4MB Matrox MGA G100 Graphics
- Windows® 95 or Windows® NT

\$1,999

There are a number of Deskpro EP options available, including Pentium® II CPU to 450MHz. Take a look at the options with the Web Direct link or phone us.

COMPAQ Deskpro EN



(61132)

(62828)

- Pentium® II 333MHz
- 32MB SDRAM, 512KB Cache
- 3.2GB Ultra ATA Drives
- 10/100 Auto. PCI Ethernet NIC
- 3.5" 1.44MB Diskette
- ATI Rage Pro AGP 1X Graphics
- 4MB SGRAM
- Microsoft Windows® 95

\$2,698 with 14" Monitor
Rent* for **\$21.00** per week, T.A.P.

There are many configurations available for the DeskPro EN. Here is a selection.

You can see the entire range at www.ht.com.au/cat/compaq

Part no.	Type	CPU	RAM	HDD	\$\$
(69546)	Celeron	300MHz	32MB	3.2GB	2,126
(62828)	P-II	333MHz	32MB	3.2GB	2,576
(62829)	P-II	350MHz	64MB	6.4GB	2,975
(62831)	P-II	400MHz	64MB	6.4GB	3,320

Prices above do not include monitor. Add \$318 - 14"

Proliant 1600 M6/350-1

Rent* for **\$5,375** per week, T.A.P.



(68432)

- Intel Pentium II CPU 350MHz
- Dual processor capability
- 512KB 2nd level ECC Cache
- 100MHz GTL Bus
- Flexible tower-to-rack chassis
- 2 x PCI Slots, 4 shared PCI/ISA Slots
- Compaq SmartStart 4.1
- Compaq Netelligent 10/100 TX PCI UTP
- Compaq Insight Manager

The Compaq Proliant 1600 server delivers best-in-class performance with outstanding high availability features. This high performance server provides the latest processor technology combined with modern system architecture.

* Conditions and exclusions may apply, call for details. Pentium is a registered trademark of Intel Corporation. Windows is a registered trademark of Microsoft Corporation in Australia and other countries.

AP 400 Professional Workstation



\$3,965

(66894)

Rent* for **\$30.86** per week, T.A.P.

- Intel Pentium II CPU 350MHz
- 512KB Cache
- 100MHz Front Side Bus
- 64MB 100MHz ECC SDRAM (Max 1GB)
- 6.4GB Ultra ATA hard disk drive
- 32x Max CD-ROM drive
- 4MB ELSA Gloria Synergy+ AGP 2D/3D Graphics
- Embedded 10/100Mbps NIC
- 16 bit Premier sound audio

Compaq RAM

32Mb
DIMM ECC
\$170
(56283)

Compaq Extras

Enhanced
Windows®95
Keyboard
\$74

(65909)

PD Disk
2 pack
\$172
(41502)

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HP Notebook Computers

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620LX
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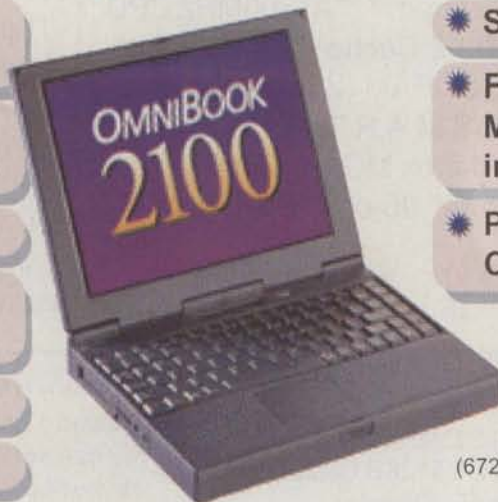


Bright, 256-colour with 640x240 pixel display. Windows CE 2.0. 32-bit RISC processor running at 75 MHz. 16MB RAM and 10MB ROM. Pocket versions of Word, Excel, Outlook and PowerPoint. Receive and send faxes, voice recording, email.

(56366)

\$1,539

- 233 MHz Intel Pentium® II CPU
- 32MB RAM Expandable to 96
- 4GB Hard Disk
- 12.1" Active Matrix Display
- Windows 95
- 24 x CD-ROM



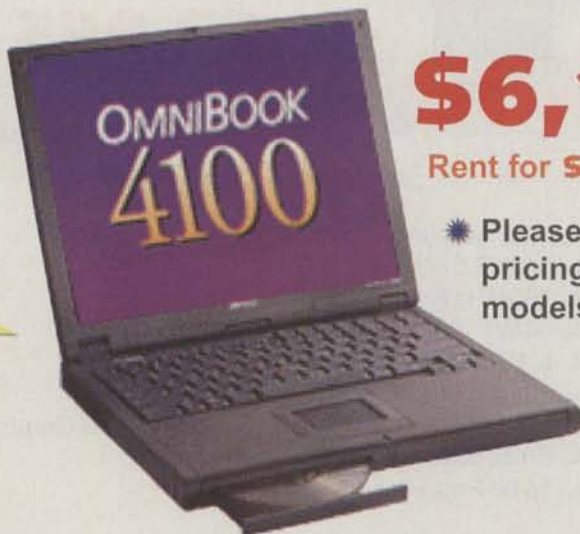
- SoundBlaster Pro audio
- Fully DMI Compliant/full Management software included
- Power Management & Cardbus support under NT

\$3,998

(67296) Rent for **\$31.12/Week***

#	Processor	HDD	RAM	OS	Screen	Rent/Week*	Price
(67297)	P II 233MHz	4GB	32MB	Win NT	12.1 TFT	\$39.57	\$5,239
(67298)	P II 266MHz	4GB	32MB	Win NT	12.1 TFT	\$37.98	\$4,879
(67299)	P II 266MHz	4GB	32MB	Win 95	12.1 TFT	\$33.46	\$4,298

HP OmniBook 4100



\$6,195

Rent for **\$46.80/Week***

Please call for pricing on other models and options

- PII 266Mhz Intel CPU
- 32MB RAM expandable to 96MB
- 6GB Hard Disk
- 14.1" TFT Display
- 24 x CD-ROM
- Lithium Ion Battery (3hr)
- Windows® 95

(61761)

*Harris TechnoRent rental plan subject To Approved Purchasers. For business-use purposes only. Rental figures shown are for 36 month terms. Weekly figures include FID and Stamp Duty and are calculated based on NSW figures so will vary slightly for other states.

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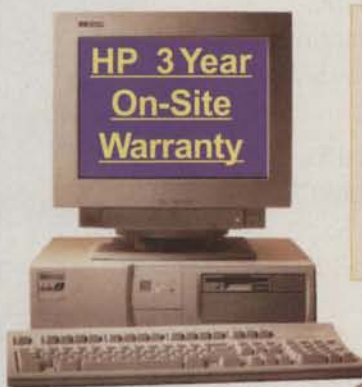


#	Brio Model	CPU	HDD	RAM	CD	Rent/Week*	Price	Includes 15" monitor
(28247)	7010 Celeron	333MHz	4.3GB	32MB	32x	\$22.53	\$2,895	
(28243)	7011 Pentium II	350MHz	4.3GB	32MB	32x	\$24.69	\$3,172	
(28241)	7012 Pentium II	400MHz	8GB	64MB	32x	\$31.12	\$3,998	

HP Vectra

The choice of corporate Australia: HPs Vectra PCs offer the latest features at great prices backed by a leading 3 year next day ON-SITE warranty.

HP PCs have it all: performance, value, reliability and brilliant networking and remote management features.



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backpage for details.

#	Vectra Model	CPU	HDD	RAM	CD	Rent/Week*	Price	Includes 15" monitor
(66796)	6617 Celeron	333MHz	3.2GB	32MB	No	\$19.77	\$2,540	
(63644)	6572 Pentium II	350MHz	3.2GB	32MB	No	\$24.64	\$3,165	
(22602)	6582 Pentium II	400MHz	3.2GB	32MB	No	\$25.42	\$3,265	

HP E-50 Netserver

The ideal
NetServer
for small to
medium
business



- Pentium® II 333MHz MMX
- 512 KB Sec. Cache
- 32MB ECC RAM
- 3.5" Floppy Drive
- 24x CD-ROM Drive
- 2MB Graphics Adapter
- 1 Parallel & 2 Serial Ports
- 6 Expansion Slots
- Enhanced IDE Controller
- Single Channel Ultra Wide SCSI Controller
- 10/100 Embedded Network Interface Card
- Mouse + Keyb.
- (66749)
- \$3,557**

14" monitor (55567)
\$474

15" monitor (42745)
\$499

17" monitor (65211)
\$875

21" monitor (40886)
\$2,899

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(63801)

\$53



**Stylus
Pens
3-pack**

(60675)

\$23



**Leather
Belt Clip
Case**

(63271)

\$49



Excellent Palm III™ Computing from Harris Technology

3Com connected organisers put important information at your fingertips. The Palm III connected organiser is the latest addition to the award winning line of small, smart connected organisers from 3Com. At just 12cm tall and 161 grams (batteries and all), 3Com connected organisers are small enough to fit in your shirt pocket or purse, and powerful enough to keep you organised anywhere you go.

Store approximately:

- 6000 addresses
- 5 years of appointments (approximately 3000)
- 1500 to do items
- 1500 memos
- 200 e-mail messages

Organiser Applications :

Date Book, Address Book, Mail, To Do List, Memo Pad, Expense, Calculator, Security, Games, HotSync.

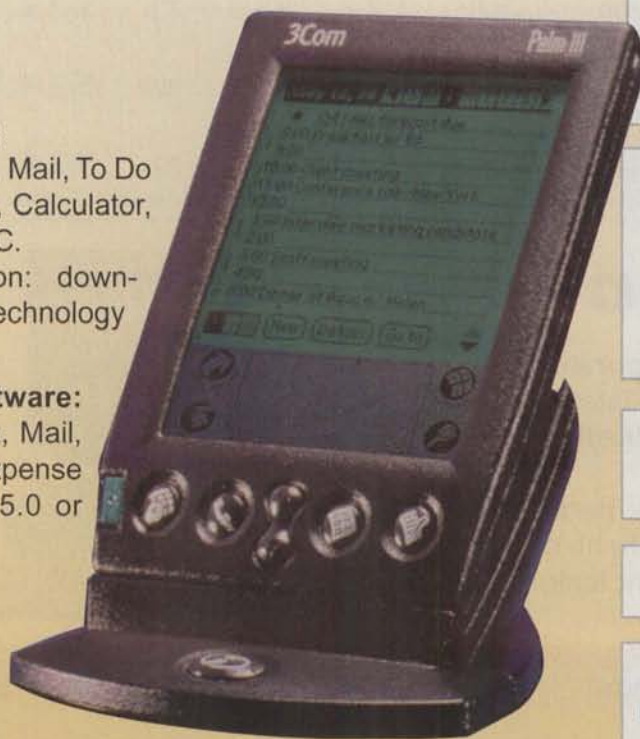
For remote synchronisation: download Enhanced HotSync technology from www.palm.com

Desktop Organiser Software:

Date Book, Address Book, Mail, To Do List, Memo Pad, Expense report templates (Excel 5.0 or higher)

\$685

(59857)



**Drag & drop
links to
Microsoft
Word
and Excel**

**Desktop import
& export
formats; CSV,
TAB Delimited,
and TXT**

**Includes cradle
and cable**

Palm OS™ 3.0

**InfraRed
Communication**



\$290

(55134)

PalmPilot™ Modem

Now you're never more than a phone jack away from your important data. With the PalmPilot™ Modem, it's easy to be more connected! Just snap onto your PalmPilot™ or Palm III™ organizer, and press a button to backup and exchange data with your PC in minutes.

- ◆ Works with organizers based on the Palm Computing® platform
- ◆ Works with PalmPilot™ and Palm III™ organizers
- ◆ Includes a 10 ft. phone cord

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New portable solutions from Targus

Air Notepac Plus Case



NEW



Nylon. For computer size: 38 x 27 x 7.6 cm. Features a zip-down workstation, a full-size expanding file section with three sections to keep your papers organized, and pockets for your cellular phone, glasses, PC cards, disks etc.

(72310) **\$119**

Air Universal Notebook Case



Koskin. For computer size: 30.5 x 25.4 x 6.3 cm, printer 33 x 28 x 6.3 cm. Two padded compartments: one for your computer, the other has dividers for power supplies, A.C. adapters, external disk drives etc. or it can hold a printer. Expanding file section.

(53560) **\$126**

Air Deluxe Universal Case



NEW



Koskin. For computer size: 39.3 x 28 x 6.3 cm, printer 44.4 x 33 x 5 cm. Accommodates both a notebook and a portable printer in the same padded compartment. A second compartment holds travel accessories or a change of clothes. Zip-down workstation.

(72311) **\$229**

Backpac

Improved design



Canvas. This backpack features two compartments: one accommodates a computer notebook, size 32.5 x 37 x 6 cm, and one holds books/files or a portable printer. Includes waist strap and reinforced padded back straps.

(26021) **\$87**



The Targus Air Protection System

The Targus Air Protection System (APS) puts a layer of pressurized air around your notebook computer to better protect it as you carry it from location to location. The sealed, pressurized air bag replaces foam padding and surrounds your notebook compartment with a thick layer of shock absorbing air.



Universal Palm PC Case For all popular models of Palm PCs

A versatile full-grain leather case that accommodates the newest Palm PCs from Casio®, Everex®, Philips®, Palmmax®, LG Electronics and Samsung®. Wallet-style. Three card pockets, holders for two spare batteries. Palm compartment size is 9 x 14 x 2.5 cm.

(72102) **\$35**



Defcon 1 Notebook security system

With the Targus DEFCON 1 on guard, you can relax in airports, restaurants, and other public places. Compact, lightweight, and easy to use.

- Easily attaches to any notebook with security lock or notebook case
- When activated the motion detector will trigger a 110 decibel alarm
- Self-retracting 1.4m steel cable

(66929) **\$125**



Retractable Telephone cord Fits right in your pocket!

Here is a convenient, inexpensive alternative to bulky telephone cables. This cord protects RJ-11 clips and puts an end to the tangles of loose cords. It works like a tape measure: simply pull one end and the telephone cord extends up to 2.4 metres.

(72101) **\$23**



Travel Connection Kit Power and telephone adapters

Doing business overseas? Better pack a Targus Travel Connection kit to connect your notebook to foreign power and telephone outlets. Two kits available: one for the Pacific Rim, one for Europe. Includes a carrying case for all connectors, a small travel pouch and country guide.

(72099/72100) **\$145**



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SCSI
accelerator
card (35145)

\$199

Zip carry case
(31823)

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Zip parallel
cable (46305)

\$40

Zip SCSI
cable (46304)

\$40

Jaz 1GB disk
(24218)

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Jaz 1GB disk
3-pck (32844)

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Jaz 2GB disk
(61652)

\$199

Jaz 2GB disk
3pck (57271)

\$520

Jaz Jet - PCI
SCSI controller
(31591)

\$199

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SCSI card
(44744)

\$229

Jaz cable
converter
(46306)

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power supply
(35154)

\$39

Jaz Traveller
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\$95

zip®

(71103)

USB \$299

NEW!



Now USB-enabled PC users running Windows® 98 can connect Iomega's sleek, translucent ice-blue **USB Zip drive**, and reap the benefits of simple connectivity and unlimited storage capacity. Once the IomegaWare software has been loaded, remove and swap the Zip drive with other USB devices without rebooting your PC.

zip®

Starter Kit

(70623)

\$315



Get started with the Zip starter kit! It's a portable parallel interface Zip drive plus four fun and practical, coloured 100MB Zip disks that are ideal for colour coding all of your computer stuff in the office, at home, at school, or anywhere. The colours make it even easier to find what you are looking for.

zip®

Ext.Parallel (21046)

\$245

Ext.SCSI (21887)

\$245



Increase your storage with interchangeable **100MB** disks. Zip drives & disks are small, light and convenient. Take them with you to move or share information. Works like your hard drive on a PC. Launch, run files & applications directly from the drive. Great for multimedia, software applications, presentations, graphics and more.

zip®

Internal ATAPI IDE

(16629)

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Fast, easy backup and archiving of your important information. Expand your hard drive without limits, 100MB at a time. High performance without the need or expense of SCSI connections. Connects to internal hard drive controller using standard IDE/ATAPI interface and internal power supply. Fits inside a standard 3.5" or 5.25" drive bay.

jaz®



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Ext. (27284)

\$595

With whopping 1GB cartridges, you'll never run out of space. It's the super fast, extremely vast personal storage drive. 10-12 millisecond seek time means performance faster than most hard drives.

jaz®

2GB

Internal SCSI (57269)

\$785

External SCSI (57270)

\$779

The Jaz 2GB drive is faster than many hard drives, has a full **2GB** of storage space in each removable disk, gives you the freedom to take your files with you, and is backward compatible with industry standard Jaz 1GB disks.



jaz® 2GB + jaz traveller



(71582)

Together for only

~~**\$874**~~

\$759

The Jaz 2GB drive bundled with the Jaz Traveller adapter. The Jaz Traveller allows you to connect your portable SCSI Jaz drive to the parallel port on any PC, making it easy for you to use your Jaz drive on a computer that does not have a SCSI or PCI SCSI adapter installed.

buz®



(53998)

\$369

The easiest way to get multimedia from camcorders, DVD, CD-ROMs, VCRs and laserdiscs into your PC!

It's a video capture and editing board combined with an Ultra SCSI controller that lets you capture multimedia (full motion video, sounds, digital pictures, music) into a PC, edit it using the easiest software around, and share it using Jaz or Zip disks, VCR tapes or the Internet.

FEBRUARY

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HARRIS

Pricing** and specifications herein are subject to change without notice



Several finance methods
available, subject to approval



All new acceleration for your PC!

Sonic Impact S90 Hot 3D Wavetable Audio!



(69486)

\$110

Diamond's Sonic Impact S90 uses advanced A3D technology to bring life-like positional 3D game play to your PC. Sonic Impact S90 includes hardware acceleration for 64 wavetable voices and Aureal's A3D to immerse you in the middle of the action. Add realistic atmospheric effects, including fog and underwater sounds, and you have total audio transformation for your PC.

- PCI design for faster system performance
- 64 Hardware wavetable voices
- Supports downloadable samples
- Runs with DOS, Win95/98, Win NT 4.0

Monster Fusion 2D and 3Dfx acceleration on one card

Monster Fusion combines 16MB of 3D gaming power with fantastic 2D graphics acceleration, all in a single card. Diamond has built on 3Dfx's Voodoo Banshee technology to deliver 1920 X1440 resolutions and 60+ frames/second game play. Yes, it's Fusion Time, baby!

- Available in PCI and AGP configurations
- Supports Glide, Direct3D and Open GL API's

(68381)

\$339



Explosive software bundle in special retail packs!

Viper V550 The Next Generation!



Looking for the most powerful graphics card on earth?

Diamond's next-generation Viper V550 combines 16MB of fast SDRAM, a breakthrough dual-processing architecture and hardware OpenGL acceleration to deliver workstation levels of 2D and 3D power, lightning-fast 3D game play and support for software DVD. Available in PCI and AGP 2X configurations.

- 128-bit dual processor architecture
- OpenGL and DirectX acceleration
- Software DVD support (AGP)
- Hot software bundle
- 16MB of SDRAM

(66530)

\$390



Monster Sound MX300 Ultimate 3D Audio Experience!!!

NEW

Want to annihilate your opponents every time? Diamond's Monster Sound MX300 delivers awesome combat tools: Aureal's delivers incredible 3D effects to give you the unfair advantage.

- Hardware A3D 2.0 Acceleration
- Accelerates up to 96 hardware streams
- Advanced 320-voice wavetable with support for downloadable samples
- Supports DOS and Windows games

(70214)

\$235



Rio PMP300 Internet Music in the Palm of Your Hand!

The first portable MP3 music player that stores up to 60 minutes of digital-quality sound. Load the latest songs onto Rio directly from your Hard Drive, personal CDs or the Internet and carry them with you. It's smaller than an audio cassette and has no moving parts, so it never skips. Powered by a single AA battery, Rio provides up to 12 hours of continuous music playback.

- Lightweight: only 70 grams
- Palm size for easy portability
- 32MB built-in flash memory

(70854)

\$489



HomeFree Easy Wireless Networking!

No holes! No cables! HomeFree delivers 1MB wireless links for up to 16 PCs, 45 metres apart.

Includes point-and-click network setup, software for shared Internet access, all at an incredible price. Windows 95/98 only.

- Frequency hopping for maximum security
- 45-metre range
- Each kit contains 2 nodes

Desktop Pac: 1 ISA / 1 PCI

Combo Pac: 1 ISA / 1 PCMCIA

(70218)

\$439

(70219)

\$499



Micronics C400 The Ultimate Multimedia Platform

NEW

Diamond's Micronics C400 motherboard is the perfect platform for your ultimate multimedia system. Featuring

Intel's 440BX AGP set, it supports Pentium II and Celeron processors up to 450MHz, Ultra DMA/33, USB, IR communications and advanced system monitoring features. For your totally accelerated PC, start with the best!

- Legendary Micronics quality & performance
- 5 PCI slots (1 shared)
- Award BIOS on 1MB flash

(70619)

\$279

NEW

(16 and 32MB flash memory upgrade options available)



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\$245
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650va
\$355
(56231)

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\$99
(42950)

for Win NT
\$139
(19558)

PREVENT DATA LOSS!

Power problems wreak havoc on today's multitasking networked or stand-alone PCs. If you don't have enough power, your computer will crash before safe shutdown, and crashes mean lost data. A UPS (uninterruptible power supply) is designed to **keep your PC working when the mains power fails**. Long enough, that is, to save your important files and shut down your PC properly. It instantly switches your computer to emergency battery backup power and allows you to work through brief power outages without data loss or downtime. High-performance surge suppression protects your computer from electrical noise and damaging power surges - even lightning.

APC Back-UPS Pro[®] For advanced workstations

- **Powerchute Pro[®]** software monitors any UPS activity, and allows you to set parameters, or schedule controlled shutdowns (for security or to save power when the PC is not being used).
- **Easy Overload Recovery.** With the quick, easy, push-button recovery circuit breaker instead of a standard fuse there is no need to return the unit to the factory for service. You're quickly back in business.
- **Audible Alarms.** If the unit is on battery, or if the battery is low, or even if there is an overload condition, APC Back-UPS Pro will let you know with an audible alarm, so you know when to save files and shut down.
- **Network Ready.** Connecting to a local area network (LAN) doubles your computer's exposure to damage. The network ready APC Back-UPS Pro protects your internal network card, your motherboard and other system components.
- **User replaceable, hot swappable batteries.**
- **Universal Hardware Compatibility.**

APC Back-UPS Pro 280va (43449) \$339	APC Back-UPS Pro 420va (37947) \$459	APC Back-UPS Pro 650va (28512) \$578
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APC Smart-UPS[®]

For small office servers

Affordable power protection for PC Servers

The new APC Smart-UPS 420 and 620 have been designed for simplicity and ease of use. They come with FREE APC PowerChute[®] Plus, the Safe-System-Shutdown and Power Management software with SNMP agents for network servers.(supports Windows NT, Novell Netware, SCO UNIX, and Windows 95.)

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- QuickSwap[™] hot-swappable, user-replaceable batteries
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- Three battery back-up/surge protection outlets
- One surge outlet for printers, faxes,scanners etc
- 10 Base-T/100 Base-TX network protection
- Two year warranty



APC Smart-UPS 620 (67198) \$725	APC Smart-UPS 420 (67199) \$529
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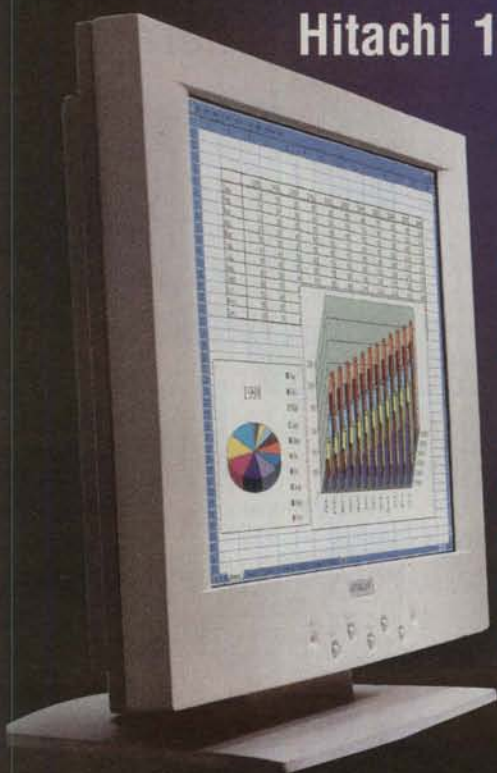
Hitachi CM641
17" monitor (70493)
\$999

Hitachi CM753
19" monitor (70913)
\$1,899



Hitachi CM811
21" monitor (70914)
\$2,880

Hitachi 14.1" Super TFT Colour LCD Monitor



- 14.1" viewable, equivalent to a 16" CRT monitor!
- Widest viewing angle available: a full 160°!
- Super small footprint saves desktop space
- 1024x768 resolution
- Power-saving
- 0.279 pixel pitch
- Wall mountable
- Clear, sharp, distortion-free images that are stable and easy on the eyes



EDITORS' CHOICE

(65626)

\$2,499

Hitachi CM813

21" up to 1856x1392 @71Hz



(70915)

\$3,285

Hitachi DVD-ROM Drive



Bare OEM drive. IDE/ATAPI interface. Bare drive, no decoder card.

(54603)

\$255

Hitachi 32x max CD-ROM Drive



Enhanced IDE (ATAPI) interface. CD-R/RW disc compatible

(67109)

\$134

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Tapes are
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(24968)

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1.3Gb
\$80
(30916)

2.3 / 2.6Mb
MO
\$119
(30936/30937)



Monitors	100ES	200ES	200GS	400PS	500PS
Our part number	(66055)	(58205)	(58798)	(57451)	(58544)
Trinitron® CRT Size	15"	17"	17"	19"	21"
Viewable Image Size	14"	16"	16"	18"	19.8"
Maximum Resolution	1280x1024 @60Hz	1280x1024 @60Hz	1600x1200 @60Hz	1600x1200 @ 75Hz	1600x1200 @ 85Hz
	\$599	\$999	\$1,349	\$1,995	\$3,194



WIN... by test driving a Sony monitor at Harris Technology you are able to enter a draw to win a DVD-ROM kit. Simply fill in a coupon, get it stamped and place it in the box provided. There are 15 weekly prizes of Sony 5x DVD-ROM drive kits. If you purchase a monitor you go into the draw to win a VW Golf! Just complete the form provided and follow the steps on the form.

Sony CD-R/RW

4x CD-R, 2x CD-RW CRX100EBK



(70899)

\$799

Internal rewritable CD-R/RW drive. 4x max CD-R writing, 2x max CD-RW writing, 24x max reading, EIDE (ATAPI) interface; 1MB cache, MTBF: 100,000 POH (duty 25%) INCLUDED: Adaptec SW, 1 blank CD-RW disc & a CD-R disc, cables & manual

3.5" Floppy Disk Digital Camera

Sony Digital Mavica MVC-FD91

Removable 3.5" 2HD floppy disk storage media. XGA (1024x768 pixel) resolution. Up to 20 still shots fine mode/40 shots standard mode per disk (VGA JPEG), 8 fine mode shots/16 standard (XGA JPEG). MPEG Movie mode (up to 60 sec.). 14x optical zoom. Optical Steady Shot. Voice memo mode. 2.5" Colour LCD screen. Auto flash. Self-timer. Six picture index on LCD. Date/Time stamp, and more.

(70203)

\$2,675



Sony Digital Mavica MVC-FD81

Shares most of the same features as the MVC-FD91 with the exception of the Optical Steady Shot function and 14x zoom lens. The MVC-FD81 is instead equipped with a 3x zoom lens.

(69230)

\$1,990



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USB
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PC USB Camera

World Standard PC (USB) Video Camera for true plug and play!

The ergonomic design of the camera allows you to position and point the camera in any direction you choose without having to hassle with adjustment handles. Just pick up the camera and you're ready to shoot.

The Philips PCA645VC features include:

- USB connectivity for true plug and play performance
- Full automatic control white balance, via USB the white balance can be controlled from the system
- Flicker free picture mode under 50 and 60 Hz light environment at each possible frame rate without any required actions from the user
- High frame rates: CIF up to 15 fr/sec, QCIF up to 24 fr/sec
- Integrated microphone and audio circuitry for live audio via USB
- A LED that shows the camera is active
- Windows98 WDM compliant driver software
- Video-mail application software



(71211)

\$249

Philips B201B



21" CRT
Optional USB.
Horiz. Scanning 30-107KHz
Res. 1800x1350 @ 75Hz

\$2,290
(44852)

Philips B201P



21" CRT
With USB & Multimedia
Audio options.
Horiz. Scanning 30-115KHz
Res. 1800x1440 @ 75Hz

\$2,550
(45876)



**Philips 3
Year On-Site
Warranty**

Philips

Australia provides a three year parts and labour on-site warranty to the original purchaser. A swap-out monitor will be provided to the customer within 24 hours by Philips.

Brilliance 15.1" LCD Monitor



The amazing Philips Brilliance 151AX TFT LCD XGA Monitor will make you question why you would buy a CRT Monitor.

This monitor is packed with features. For power users it has an option for a USB hub, with 4 downstream ports for easy connection of any device to your computer. With a super 15" viewing area, and a super tiny footprint, this monitor is perfect for any application. It has no Electro-Magnetic Emissions and complies fully with the EPA Energy Star Standards.

● Windows '98 compliant

● Small 17.6 cm (7 inch) footprint; weighs only 5.2 kg

● Display performance comparable to a 17-inch CRT monitor, with even better picture clarity and geometry

● No need for user geometry setting adjustments due to Philips advanced TFT technology

\$1,990

(22421)

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It's your world. Be there.

SPECIAL OFFER!

When you purchase the Wave SP56 Dual Modem during the month of February, you will receive a **FREE HEADSET** worth **\$25!!**

Banksia Wave SP56 Dual

Catch the V.90 Wave!

(46276)

\$249



The Wave SP56 Dual modem lets you fly through the Internet faster than ever before, as much as twice as fast as previous modems.

- ITU V.90 and K56Flex Dual Mode operation
- Smart answer phone
- SVD capable
- Hands free full duplex speakerphone with echo cancellation
- Upstream data transfer at 33.6Kbps, downstream data transfer up to 55.6Kbps
- 3 year parts & labour warranty, with lifetime support



Banksia MyModem 56V

Now with

SYMANTEC.

WinFax PRO 8.0

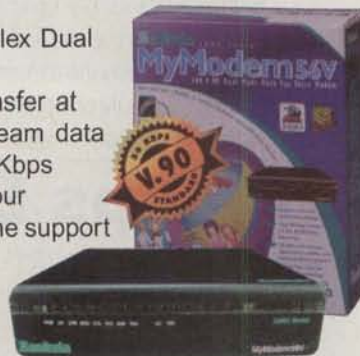
The reliable modem

The MyModem 56 Dual Mode V.90 and K56Flex modem is a high performance, low cost, easy-to-use modem for users who run PCs at home or in small businesses. It sends data at 33.6Kbps (receive at up to 55.6Kbps) and sends faxes at 14.4Kbps. It comes bundled with Windows fax and data software. And MyModem has now enhanced its business power with the addition of Symantec's WinFax Pro (OEM).

- ITU V.90 and K56Flex Dual Mode operation
- Upstream data transfer at 33.6Kbps, downstream data transfer up to 55.6Kbps
- 3 year parts & labour warranty, with lifetime support

(62589)

\$244



Simple NetExpress 56



K56Flex & V.90 Data Fax Voice speakerphone SVD modem. Includes all you need to start exploring the World Wide Web! (65858)

\$199



Zetafax

The most advanced fax software for your PC network

Easier than using a fax machine and the faxes you send will be **sharper**. Saves time and money:

no more waiting by the fax machine. Zetafax **queues faxes** for sending and will **redial automatically** if the line is busy. Monitor faxes sent and received. Detailed **logs** for each fax indicate where and when it was sent. **View** or **print** received faxes. Supports all major operating systems. Includes client and server software. **Scalable. E-mail gateway** option.

Single User NT System

(24924)

\$209

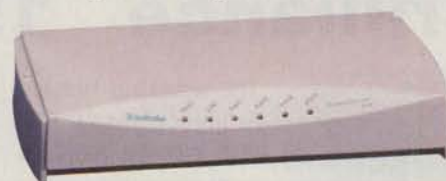
5 User System

(36049)

\$769

Banksia CommServer

Affordable remote access for everyone in your business



CommServer CS410 is a communications and remote access server with an Ethernet connection designed to provide shared inwards and outwards communications over an office Ethernet LAN.

- Allows multiple users to concurrently access the Internet, send a fax or access remote data
- Simultaneously share up to **4** external modems with regular phone lines
- Start with one modem, add more later when needed.
- Dial-in remote access

4 ports (58577)

\$1,445

NetComm



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NetComm SmartSecurity Hardware Firewall

Internet security solution



SPECIAL PRICE

(70906)

\$2,999

Special price offer valid for the month of February 1999 only.

Designed for small to medium-sized business networks, NetComm's SmartSecurity is the industry's most affordable Internet security solution and offers a powerful combination of firewall and Web content filtering. It uses the latest third generation firewall technology, 'Stateful Inspection' which examines all OSI layers to either accept or reject the requested communication. Stateful inspection is invisible to the users on the LAN and requires no client configuration. In addition it supports numerous Internet protocols, including TCP and UDP which are required by applications such as DNS, DHCP and Real Audio.

- Protects a LAN from Internet hackers and intruders
- Active Web content filtering ensures that network users are protected from undesirable Internet information
- Easy to install and manage
- Separate ports for WAN, DMZ (Demilitarised Zone) and LAN

NetComm Card Modem 56 Global/GSM

Now with
SYMANTEC.
WinFax PRO 8.0



Gives the world traveller the freedom of data connection either through a Land line or Mobile phone (GSM), with data download speeds of up to a scorching 56,000bps as well as the ability to send and receive faxes of up to 14,400bps. So no matter where you are - in a multitude of countries around the world, you'll always be in touch with the NetComm 56 Global.

- K56Flex, FLASH upgradable to new ITU standard V.90 via download from website.
- GSM ready (GSM connection kits sold separately, please call for information)
- Approved in 24 countries
- Nokia Approved

\$419

(30658)

NetComm Roadster II 56 USB

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SYMANTEC.
WinFax PRO 8.0



Designed for Windows® 98

- Connect via Universal Serial Bus Port
- Powered by **USB**, no bulky power pack needed
- Features full voice capability with voicemail and handsfree speakerphone operation (headset included)
- Inbuilt SVD technology: Talk and send data at the same time over the same phone line

\$284

(63379)

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WinFax PRO 8.0

NetComm CardModem 56



(52694)

\$328

NetComm CardModem 56 Combo Ethernet



(52693)

\$315

NetComm Roadster II 56K V.90 Ultra SVD Modem



(61194)

\$264

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Four shielded 100Base-TX ports
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Hub TP800

Eight shielded 100Base-TX ports
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Hub TP1200

Twelve shielded 100Base-TX ports
(56402)

\$699

3Com Megahertz® 10/100 LAN + 56K Modem PC Card

(67217)



Today's easiest
combocard to
configure and use

**SPECIAL
LOW PRICE!**

~~\$629~~
\$425

It practically sets itself up- including those mind-numbing drivers. It combines the world's leading Ethernet technology and the 3Com Megahertz 56K modem into a single PC card. It also delivers today's fastest 10Mbps connections with automatic 100Mbps network configuration when you're ready. It also offers 56K technology with the V.90 ITU-T standard built-in.

3Com Megahertz® 56K Global Modem PC Card V.90 56K

(58084)



Hassle-free access and
high-speed downloads
anytime, anywhere

**SPECIAL
LOW PRICE!**

~~\$364~~
\$315

Delivers hassle-free access for global travelers and the V.90 56K standard for downloads up to 56Kbps worldwide. Features WorldPort™ country selection software to easily configure your modem for use around the world, Intelligent Auto Install for easy, doubt-free installation, and Digital Line Guard to alert you when connecting to potentially damaging digital or PBX lines.

Special pricing available until the end of February, so be quick!

3Com U.S. Robotics

Full-duplex
speakerphone support

Stores voice and fax
messages, even when
your PC is switched off

Forwards incoming
faxes to any phone
number, even when
your PC is switched off

Make up to 100
documents available to
callers with Fax-on-
demand

Personal voice mail
with single/multiple
mailboxes

56K Message Modem



\$279

(70929)

56K Professional Message Modem



\$319

(70928)

BOTH modems feature:

- Faster Internet access
- Independent Voice Messaging. Enables the modem to store incoming voice and fax messages with the computer switched off. Messages can also be retrieved remotely through a dial-up connection.
- 3Com Modem Manager. Enables the user to watch their send and receive throughput change, graphically and digitally, in real time.
- Easier installation and use
- Backed by a Lifetime Limited Warranty
- Software upgradeable for future enhancements
- Valued-added Connections CD-ROM Software

The Professional Message Modem ALSO features:

- Caller ID
- One-button access to voice messages
- Built-in high quality speakerphone
- V.80 (video conferencing) capable
- Independent Fax Forwarding. Enables the modem to forward receiving faxes to a pre-specified telephone number, even when the computer is turned off.

Includes V.90 56K standard & x2™ technology

Data Fax Modems & Ethernet Cards

RealPort™ Integrated PC Card Family

Features and Benefits: • 16-bit and 32-bit interfaces available • Integrated Ethernet LAN, modem, and telephone handset pass-thru connectors provide reliable, cable-free connectivity • Uses standard RJ-45 Ethernet and RJ-11 telephone cords • Digital Shield™ protects modem from high-current digital phone lines • GlobalACCESS™: one card for worldwide use • GSM and AMPS-cellular capable • ISDN capable • Connects notebooks to either 10Mbps or 100Mbps Ethernet networks • Supports modem speeds up to 56K

Lucent Technologies
Bell Labs Innovations



Xircom RealPort Ethernet 10/100 + Modem 56K



(61795) **\$690**

The integrated PC Card: nothing to break, nothing to lose

The first 16-bit integrated PC card with built-in connector system. It has all the features you need to connect to information in the office or on the road, anywhere in the world. One PC Card- no custom cables to lose, no pop-out jacks to snap and leave you stranded. All you need are standard Ethernet and telephone connectors, and you're ready to access information anytime, anywhere.



1. Slide into PC Card slot



2. Plug in standard LAN & phone connectors



3. Ready to access information in the office or on the road

Xircom RealPort Modem 56 GlobalACCESS

With RealPort Integrated PC Cards, there are no cables to lose or moving parts to break. Lowest cost of ownership: integrated PC Cards reduce support calls, user down time and eliminate cable replacement. Flash ROM-upgradable to 56K (V.90) at no charge.



(68724) **\$339**

Xircom RealPort Ethernet 10/100

RealPort Integrated PC Card LAN solutions offer mobile users high-performance 10Mbps and 100Mbps Ethernet connectivity for the most reliable access to information while in the office. • Robust integrated connectors • Easy to use • Longer battery life • High performance



(67216) **\$299**

Xircom RealPort CardBus Modem 56 GlobalACCESS

RealPort Integrated PC Card Modem solutions offer mobile users high-speed 56K modem, GSM, AMPS cellular and ISDN functionality. GlobalACCESS™ features make it easy to connect to information from any location, anywhere in the world.



(70228) **\$339**

CreditCard 56K modem



(54763)

\$299

CreditCard 10/100 Upgradable



(27310) From

\$257 UTP

10Mbps Pocket Ethernet



(10257) From

\$569 Coax

Creditcard 10/100BTX Ethernet + 56K modem + minidock



(56359)

\$599

CardBus 10/100 Ethernet



(38605)

\$348

Credit Card GSM Modem



(55026)

\$395

Ericsson compatible

Save money, ask about Xircom RealPort multi-packs



(55838)

MiniDock™ Connector System

Combines both LAN and modem connectors in a single, durable device, enabling you to connect easily and reliably when accessing data from corporate networks, the Internet and other online services. It also features convenient LEDs displaying modem and network status information at a glance.



\$62

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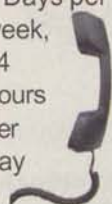
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24
hours
per
day



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10Mbps ISA +
10ft cable
(NE2000
compatible)

\$40

(58728)

FA310
10/100 PCI
(Speed
sensing, PnP)

\$86

(53460)

NETGEAR
FA410
PCMCIA
Network Card
(60071)

\$246

FEBRUARY

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28

NETGEAR™ RM356 Router

(70197)

NEW



\$629

Connect multiple PCs to
the Internet easily

This Netgear router provides shared Internet access in a box. Small offices/home users can connect multiple PCs to the Internet to access email and download information, programs, or games with a single connection, using one ordinary phone line and one Internet Service Provider account.

- Single-box Internet access solution: router + integrated 56K modem + integrated 4 port 10BaseT hub
- DHCP server
- Dynamic NAT+
- Dial-on-Demand routing
- Hi/fn (STAC LZS) compression
- Unlimited PC connections
- Five year warranty
- Unparalleled NETGEAR free 7x24 support

I'm on my
way to Harris
Technology to get
one NOW!



FS108 10/100 Mbps Slimline Switch



**PRICE
BREAKTHROUGH**

- Full Duplex/Half Duplex operation
- 8x10/100Mbps switched ports
- External Power Supply

\$999

NETGEAR (70905)



10Mbps Ethernet Hubs

(53456)	EN104TP	4-port slimline 10baseT	\$ 86
(53455)	EN104	4-port slimline 10baseT, BNC	\$128
(53458)	EN108TP	8-port slimline 10baseT	\$132
(53457)	EN108	8-port slimline 10baseT BNC AUI	\$174
(53459)	EN116	16-port slimline 10baseT BNC AUI	\$290
(17425)	EN516	16-port rackmount 10BT BNC AUI	\$398
(17435)	EN524	24-port rackmount 10BT BNC AUI	\$499

Netgear Dual Speed Hubs

4 Port Dual 10/100 Slimline DS104



This Netgear Hub connects multiple PC's to share printers, files, Internet Access, and E-mail communications.

- Auto-sensing dual speed ports
- Each port works at 10 or 100Mbps
- Easy, plug-and-play installation
- Compact, sturdy, metal case
- Vista network ports with built-in LEDs

\$269

(70795)

8 Port Dual Speed (10/100) Hub Slimline



DS-108 (18755)

SRP \$499

Dual Speed 10Mbps/100Mbps Hubs stackable



DS-508 (18738) 8-port

\$883

DS-516 (18747) 16-port

\$1,499

DS-524 (69474) 24-port rackm.

\$1,999

NETGEAR Print Servers



PS110 - Two bi-directional parallel printer ports and 1 autosense 10/100Base-Tx Ethernet ports. Diagnostic LEDs. Prints concurrently from NetWare, Windows for Workgroups, Windows 95, Windows NT and Unix.

(67226) **\$425**

PS104 - One bi-directional parallel printer port and four 10Base-T Ethernet ports. Diagnostic LEDs. Prints concurrently from NetWare, Windows for Workgroups, Windows 95, Windows NT and Unix.

(67225) **\$328**

HARRIS

Pricing** and specifications herein are subject to change without notice



Cheques OK with 2 x valid ID
or T/T. Call for details.

Fast Inter-office Connections

Introducing an **Easy** way to connect your business!

Fractal™ Business Connect for 2 - 5 Offices

Telstra announces Fractal *Business Connect Easy Pack* - a range of office-to-office network packages for businesses wanting to connect 2 to 5 sites. With Fractal *Business Connect Easy Pack* you can improve communications with employees, customers and suppliers, while increasing both productivity and revenues.

In this time of rapid change, you need your network to be a predictable and reliable part of your business - Fractal *Business Connect* is the affordable choice for your business and delivers total ease of ownership.

Telstra's experience is second to none when it comes to data networks and these packages have been designed in a way that's best for performance, reliability and your bottom line. Telstra know what organisations need from their networks and by partnering with Cisco Systems, the world's leading networking vendor, Fractal *Business Connect* delivers all the advantages of a best-of-breed solution.



Options:

Router software for support of more than 30 users, inc IPX
Upfront \$236
Mthly \$7

Cisco 771 4 user hub
Inc Mthly Maintenance
Upfront \$156
Mthly \$57

Hub for 4-8 users - Cisco 1502, inc installation & maintenance
Upfront \$633
Mthly \$16

Hub for 8-16 users - Cisco 1516, inc installation & maintenance
Upfront \$1,202
Mthly \$34

Key Benefits

- Single point of contact
- Single bill
- Telstra OnRamp ISDN
- Cisco Routers
- Telstra installation
- Telstra support
- Big Pond business option

Example

There are a number of combinations and solutions available. Please call us to determine your specific needs. Here is one common example

Two offices with no Big Pond Internet requirement
Connecting for average of 3 hours per day

	Upfront	Mthly
2 x Cisco Router	\$2,376	\$0
Installation & Monthly access	\$390	\$100
Support - Telstra On Site SBH Next Business day	\$0	\$48
Totals...		
Network ownership costs (Actual)	\$2,766	\$148
Network usage costs - indicative (3 hrs/day)		\$110

Total Annual Costs, Year 1 → \$5,861 • Year 2 → \$3,095 • Year 3 → \$3,095

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Fax 02 9925 9897

Website www.ht.com.au
E-mail sales@ht.com.au

**Open
7 Days**

Multi-Server Controller

Control up to 256 network servers with a single monitor, keyboard & mouse

With a ServerLink you can monitor and fully control up to 256 network servers with just one monitor, keyboard and mouse. Save money on expensive monitors, create more working space and cut down on your power costs.

Designed and manufactured in Australia by an award winning engineering company, ServerLink is packed with features, providing total control of your ever expanding network.

ServerLink to computer cable

Each end of the cable fans out into three connectors.

2m cable for PS/2 mouse, keyboard and monitor (63972)

\$18

5m cable (63976)

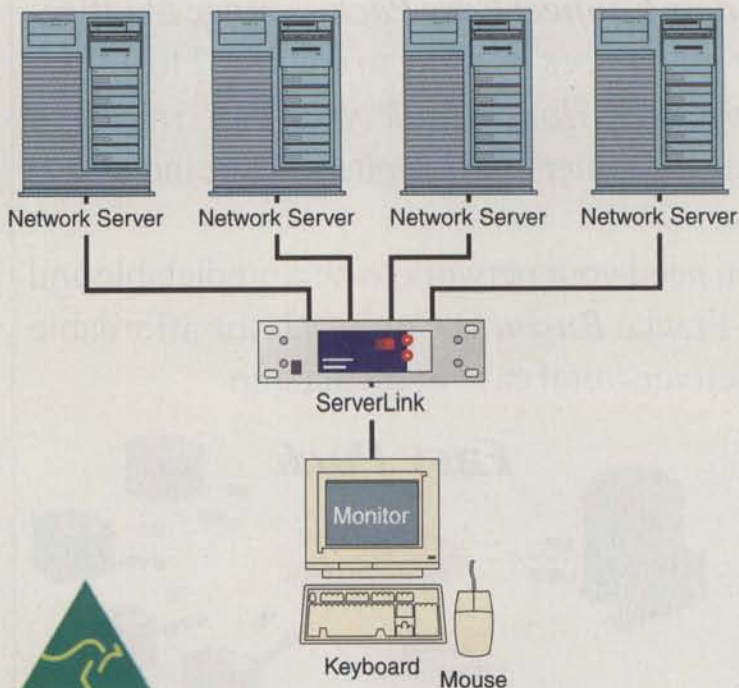
\$77

2m cable for AT/Serial mouse, keyboard and monitor (63974)

\$17

5m cable (63977)

\$75



- Available in 4, 8 and 16 port models
- 3 Year warranty
- Australian made

ServerLink™

Multi-Server Controller



From
\$475

(71652, 4-port)

- Select servers via On-Screen-Display
- Name servers for simple selection
- Mouse & keyboard emulation for flawless booting
- Scan Mode for periodic server monitoring
- Supports PS/2 and Serial mouse emulation
- Only one physical mouse required to operate both PS/2 and Serial Servers
- Backup power feature eliminates system power failure
- EPROM upgradable for future technology
- 8 and 16 port models 19 inch rack mounted design



Pop-up
Screen
Menu
Control

ServerLink™



**Fast delivery
Australia wide**

Have a look here for more information

**Web
Direct**

www.ht.com.au/cat/intel

Intel® InBusiness™

Small Business Networking



(58551)

\$819

Intel InBusiness™ Internet Station

- Multiple user Internet Access over a single line
- Simple web-browser configuration and management
- InstantIP™ technology saves time and money on Internet addresses
- Supports both analog and ISDN lines
- Two additional ports for "dial out" and "fax out"



(68444)

\$545

Intel InBusiness™ 8-Port 10/100 Hub

- Easily connects devices to create a Fast Ethernet network
- Simple installation, no software required
- 10/100 Auto-sensing each port



1 Port

\$509

(63213)

3 Port

\$749

(70916)

Intel NetportExpress™ 10/100 Print Server 3-port

The Netport Express 10/100 Print Server delivers outstanding performance, anticipating tomorrow's needs by exceeding the demands of today.

- Reliability and performance through Intel® processor technology
- Super low cost
- Intel i486 processor on board

**HOT
NEW PRODUCT**



(71213)

\$1,559

**JUST
RELEASED**

Intel InBusiness™ eMail Station

Introducing... an exciting new network appliance from the Intel InBusiness™ product line - the eMail Station!

Designed specifically for small businesses, the Intel InBusiness™ eMail Station is an easy way to facilitate communications. Simplified LAN and Internet e-mail services give the office a professional image with the company's own e-mail domain name.

Intel InBusiness™ 5- and 8- Port Hubs



5-port 10mbps
hub: (58547)

\$115

8-port 10mbps
hub: (58548)

\$139

Intel InBusiness™ 8-Port Switch and Switch Plus



8-port 10mbps:
(58552)

\$499

8-port 10mbps
+
2x 10/100
ports:
(58553)

\$669

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31

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D-Link®

We offer a wide range of D-Link products. Call us, or have a look at this Web Direct link.

Web Direct

www.ht.com.au/cat/dlink

D-Link

Building networks for people

Multiple Protocol Print Servers DP-101

Ethernet Print Server. One parallel port. Pocket size!



(70076)

\$299

56KFlex Modem External

(65472)

\$184

Internal

(65473)

\$135

D-Link DP-602 Internet Server

NEW PRODUCT



(59820)

\$475

Connecting your LAN to the Internet is now easier with D-Link's NEW Internet Server

- Share ISP Accounts
- Share Modems
- Analog and ISDN support
- Dial on Demand
- Dual speed 10/100 LAN port
- 56Kbps modems/128Kbps BRI ISDN TA support
- 2x RS232 COM ports

- Bandwidth doubling through simultaneous use of 2 COM ports
- Firewall protection, PPP security
- Admin through Telnet, Web browsers, Windows based program
- Flash memory for firmware upgrade



(62956)

\$59

DFE-530TX

10/100Mbps Ethernet / Fast Ethernet PCI Adapter

- Single RJ-45 connector autodetects network speed
- 32-bit bus master burst mode removes network bottlenecks
- Ideal for high-power servers and videographic or multimedia stations
- Plug and Play installation



(53599)

\$99

DE-805TP

Ethernet 5-port mini 10Base-T hub "HUBBY"

Pocket-sized portable hub for 10BASE-T, designed especially for small workgroups. Provides 5 twisted-pair ports for 5 users, and can be easily expanded by cascading with another Hubby or another 10BASE-T hub.

HP Blank CD-R

(63823)

\$5

HP Blank CD-RW

(63824)

\$30

HP CD-Labeler

(66431)

\$82

30 Labels

(66432)

\$37

60 Labels

(66433)

\$67



HEWLETT PACKARD

Expanding Possibilities



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HP SureStore CD Writer

Fastest, easiest way to make your own CDs

HP SureStore 8100i Internal



(71619)

\$869

- High Quality, High Performance
- Reads CD-R at 24x
- Writes CD-R at 4x
- Writes CD-RW at 2X
- Includes Adaptec software & more
- 1 year HP Warranty
- Kit also includes: IDE cable, audio cable, one CD-R and one CD-RW disk.

HP SureStore 7200



HP Surestore 7200i IDE Internal (57293)

\$649



HP Surestore 7200e Parallel External (57294)

\$889

- Value Priced, Premium Performance
- Reads at 6x
- Writes at 2x
- Includes Adobe software to create & edit images
- 1 year HP Warranty

FEBRUARY

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HARRIS

Rent: Short or long term. Finance options available: IBM Easylease, AGC.



Cheques OK with 2 x valid ID or T/T. Call for details.

For all your Data Storage



Hard Drive UPGRADE KIT



What's in the Box?

- 5,400 - RPM MEDALIST drives bring multimedia performance and high capacities at an exceptional value.
- ◆ Seagate Ultra ATA Hard Drive
 - ◆ Frame kit, mounting, brackets and drive screws
 - ◆ Antistatic wrist strap
 - ◆ Multimedia-Ready for full-screen, full-motion videoplayback and MMX
 - ◆ ATA transfer rates up to 33.3 Mbytes per second with Ultra ATA
 - ◆ Seek times as fast as 11 msec
 - ◆ Designed for Pentium PC's
 - ◆ 3 Year Warranty

ST34321A
4.3Gigabyte
\$336
(63296)

ST36531A
6.4Gigabyte
\$393
(63297)

ST38641A
8.6Gigabyte
\$457
(63298)

ST310240A
10Gigabyte
\$536
(66358)

Tape Back Up Kits

- ◆ Travan TR-4 Internal Tape Back-up kits
- ◆ 4 Gig native up to 8 Gig with software compression
- ◆ Includes software for Win3.x, Win 95 & NT Workstation
- ◆ 2 Year warranty
- ◆ Includes 1 x TR-4 Tapes



STT28000A-RFT
Internal SCSI
(56141)

\$475

**Unit is
pictured
installed into
an external
casing

STT28000N-RFT
Internal IDE
(56140)

\$624

Seagate Software

Small Business Server Suite 7.0 for Windows® NT



(17405)

\$954

Features:

- Fully integrated with the Microsoft BackOffice Small Business Server.
- Integrated backup, restore, disaster recovery and virus cleaning.
- Unattended operation any time of day or night.
- Easy to use Wizards.
- Single step online backup of Exchange, SQL and the BackOffice Small Business Server.



Seagate
Backup
Exec 7.2
for
Windows®
NT

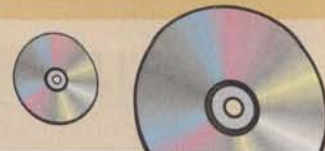
Multi-
Server
(70745)

\$1,770

Single
Server
Edition
(69759)

\$954

CD Writers



RICOH MEDIA

Ricoh CD-R
Blank Media
74 Minutes
650Mb
(54770)
\$4

Ricoh CD-R
Blank Media
74 Minutes
650Mb - 5
Pack
(55092)
\$18

Ricoh CD-
RW
Rewritable
media 74
Minute
650Mb
(55094)
\$34

Ricoh CD-
RW
Rewritable
media 74
Minute
650Mb - 5
Pack
(55093)
\$152

Internal Rewritable Drive

- Double speed (2x) recording of CD-RW and CD-R
- Up to 6x Reading Speed of CD-RW, CD-R and CD-Rom discs
- 350ms Access Time (at 6x)
- 1Mb Data buffer
- Tray loading mechanism
- Class 3 Million Dust-proof even with the tray loading mechanism
- supported by all Major CD Premastering software
- Kit contains Direct CD, Easy CD Creator 95/NT, Audio cable, jumper Pins, Mounting screws, Installation manual, 1 x Ricoh CD-R's & 1 x Ricoh MP6200S



\$599

(57263)

PowerCore ZapCatcher Level 2 Single Stage Filter

Protect your valuable possessions with this little beauty.

High quality single stage power filter with front end surge diverters and Telecom line Surge protector.

Ideal for the home PC with Fax/Modem or standalone fax machines

- 6.5Amp 8/20uS peak Surge
- 40Db noise attenuation
- Power and strike indicators
- Includes RJ11 to RJ11 phone cable



Level II Single Stage Filter **\$159**

Level III Multi Stage Filter **\$189**

(44599, 44600)

Canon

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www.ht.com.au/cat/canon

You can on a Canon, can do!



Canon BJC-7100

NEW

Colour Bubble Jet Printer



(72294)

\$599

A breakthrough in colour quality at up to three times the speed

High resolution

Prints up to 1200dpi

Enhanced printing speed

Up to 7.6 ppm in black and white, up to 4.8ppm in colour.

Seven colour printing system

Using conventional CMY and low density CMY inks to produce 25 saturation levels per pixel on any medium, including plain paper.

PhotoRealism

Includes black and ink optimiser cartridge (BC60) and PhotoRealism cartridges (BC62e) in the box.

Plain Paper Optimised printing

Printing on plain paper is 99.4% water fast, colours are more vibrant and tones are sharper because the inks do not blend in unwanted ways.

Warranty

Covered by a one year warranty extendable to three years for a minimal cost and backed by Canon's customer care hotline support.

Canon BJC-4310SP

Colour Bubble Jet Printer

- Super Economy Mode for low-cost printing
- Canon's **Drop Modulation Technology™** delivers smoother colour gradations
- Use Canon's **PhotoRealism** inks for more colour combinations and virtually no pixelation
- Optional scanner head
- Super fast black & white: 4.5ppm*
- Banner printing: print banners up to six A4 pages in length!
- Resolution: 720x360 dpi



(68730)

\$248



*Approximate print speed

CanoScan FB320P / FB620P

Flatbed Scanners



- Only slightly larger than a sheet of A4 paper
- Spectacular image quality
- Comes with fun-filled photo-editing software
- Includes driver to convert your CanoScan FB320P or FB620P into a **photocopier!**
- Parallel interface
- Maximum document size A4/Letter
- Selectable resolution 25 to 2400 dpi

CanoScan FB320P

Optical Resolution:
300 x 300 dpi

(68733) **\$196**

CanoScan FB620P

Optical Resolution:
600 x 600 dpi

(68734) **\$274**

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35

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HP Laser Printers

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HP papers, toners etc.

COLOUR



HP Colour LaserJet 4500

16ppm mono
4ppm colour
32MB RAM
standard
HP PCL5/
PS2
(70356)

\$5,589



HP Colour LaserJet 8500

24ppm mono
A4, 6ppm
colour A4,
3ppm colour
A3.
600x600dpi,
32MB RAM.
(70355)

\$13,788

Call our
friendly Call
Centre
staff to help
you choose the
right HP
LaserJet for
your needs on
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9925

HP LaserJet 2100 Series

HP introduces three
great new laser printers
that offer excellent
performance, expanda-
bility & flexibility, and
superior value.
1200dpi, 10ppm, 4MB
RAM.
60MHz processor, 350-
sheet paper capacity.
15.000 page monthly
duty cycle.



LaserJet 2100

A fast flexible laser with
room to grow. (EIO, PCL 6)

(72291) **\$1,959**



LaserJet 2100M

A fast flexible laser with
PS and PCL. (EIO, PCL 6,
additional 4MB RAM)

(72292) **\$2,198**



LaserJet 2100TN

A complete network printer.
(EIO, PCL 6, additional
4MB RAM and 250-sheet
paper tray, HP JetDirect
print server installed)

(72293) **\$2,559**



HP LaserJet 1100 Printer

The 600dpi print resolution with HP's Resolution Enhancement technology (REt) makes every document more professional. Network compatibility available. HP's exclusive JetPath technology allows you the flexibility to expand the HP LaserJet 1100 printer into an All-in-One performer when your business needs grow. 8ppm print speed. 2MB RAM.

(70095) **\$789**

If your current
business needs
require the HP
LaserJet 1100 with
copying and
scanning
capabilities, move
up to the LaserJet
1100A.

HP LaserJet 1100A Printer - Copier - Scanner

Offers printing, copying and scanning All-in-One. In addition to crisp, sharp laser printing, you can make laser copies at the touch of a button, even without the PC turned on. Full scanning capability enables you to transform hard-copy documents to electronic images to work with on the desktop, file, or communicate via e-mail and PC fax.

Scan resolution 600dpi enhanced, 300dpi optical.

(70096) **\$976**



HP LaserJet 4000

- 17ppm, 100MHz RISC
- HP PCL6 & PostScript level 2
- 1200 dpi
- 600 sheet standard input
- 4MB RAM
- Warm up time less than 15 sec.

From **\$2,239** (54375)



HP LaserJet 5000

- 16ppm, 100MHz RISC
- HP PCL6 & PostScript Level 2
- 1200dpi
- 250-sheet input tray
- 4MB RAM (exp. to 100MB)
- Print size up to 11x17"

From **\$2,889** (60548)



HP LaserJet 8000

- 24ppm, 133MHz RISC
- HP PCL 6 & PostScript Level 2
- 1200dpi
- 2 x 500-sheet input tray
- 16MB RAM (exp. to 192MB)
- Print & duplex up to 11x17"

From **\$4,358** (60551)

HP DeskJet Printers

Have a look at www.ht.com.au/cat/hp
for HP inkjet papers, transparencies,
inks, toners etc.



HP DeskJet 695C

Easy to use - great quality

- HP PhotoREt Technology
- Dual cartridge
- ColorSmart II
- New improved driver - Windows 3x/95/NT 4.0
- Photo capable with optional Photo Head
- New super economy mode
- Black: 600x600dpi, 5ppm
- Colour: 600x300dpi, 1.7ppm



(66260)

\$290

HP DeskJet 880C



NEW

Super-fast, stunning print quality on plain paper

- HP PhotoREt II Technology
- Black: 600x600dpi, 8ppm
- Colour: 300x300dpi, 5ppm
- Poster and n-up printing
- USB and parallel interface
- Black text more crisp and laser-like than ever
- Photo quality colour

Call for
pricing

**USB
INTERFACE**

HP DeskJet 1120C

Do you dream in colour?

- Prints up to A3 size
- HP PhotoREt II Technology
- Network ready
- Black: 600x600dpi, 6.5ppm
- Colour: 600x300dpi, 4.5ppm
- Print banners, posters, booklets etc. with additional software
- HP ZoomSmart for resizing
- Superior results



A3

(56298)

\$845



HP DeskJet 710C

PhotoREt II
600x600dpi,
6ppm black
600x300dpi,
3ppm colour
100 sheet
paper tray
Quiet operation

**PRICE
DROP**

\$335

(68905)



HP DeskJet 895Cxi

It's fast!

PhotoREt II
Networkable
10ppm black
6ppm colour

**USB
INTERFACE**

**& Parallel
\$798**

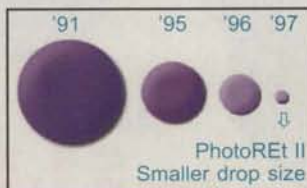
(70705)

What is PhotoREt II ?

Over the last several years, dots per inch (DPI) has become one of the specs people associate with print quality. But higher DPI doesn't necessarily equal better print quality. There are drawbacks to increasing dots per inch, including bigger file size, slower print speed and less control of the ink on plain paper. All those drops of ink can make plain paper wet and wrinkled. But there is an alternative. The new HP printers feature a breakthrough HP technology known as PhotoREt II. It maximizes efficiency of the new HP colour inkjet cartridge to fire ink drops that are 70% smaller than those of previous cartridges, and the smallest dots yet compared to other desktop inkjet printers. It allows the cartridge to place up to 16 drops of ink on a single pixel, producing more colours per printed dot.

What does this mean for your print-outs?

You will get vivid colours, smoother skin tones, less graininess, sharper edges, smoother colour transitions and better image resolution on plain and special paper, without sacrificing print speed.



PhotoREt II..
Preferred by most
advanced life
forms





You don't have to leave
your galaxy to buy Harris
Technology products.
Just order on-line!

For the latest info & pricing look here ↴

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The HP "All-in-One" Series



HP OfficeJet 590

Colour
printer, fax,
copier,
scanner.

**PRICE
DROP**

\$625

(50788)



Ask about
the One-Year
HP Express
Service
Warranty for
your
OfficeJet 590
or 635.
For inks &
toners see
www.ht.com.au/cat/hp



HP LaserJet 3100

Printer, fax,
copier,
scanner.

\$1,378

(58566)

HP OfficeJet Pro 710 *Prints, faxes, scans & copies all in colour*



(71269)

\$980

NEW!

That's right - it even sends and receives colour faxes with other compatible colour fax machines. You can even scan and send colour documents to anyone with an email address. It's communicating made easy with colour faxing and scan-to-email.

Print: Brilliant colour with HP PhotoREt and optional photo cartridge. Up to 5ppm black, 2ppm colour. **Fax:** Full-featured plain paper fax, plus colour fax. PC not required for black & white faxing. PC-assisted colour faxing to and from other colour fax machines. Speed dialing and automatic redial. **Scan:** Makes it easy to add photos to your emails or other Windows applications to jazz up your projects. **Copy:** Saves trips to the copy center. PC not required for black & white copies.

HP OfficeJet 635 *It's a fax, a colour printer, colour copier, and colour scanner!*

Completing your work in colour is now convenient and easy. The HP OfficeJet Series 600 prints, scans and copies in colour, making it simple to impress customers or clients. Plus it's a plain paper fax. You get four essential office devices in one powerful package! **Print:** 600x600dpi and up to 5ppm black, 600x300dpi and 2ppm colour. **Fax:** Fast, full-featured plain paper and PC faxing. 20-page automatic document feeder for unattended faxing. 100 speed dials. Large multiple-page memory. Automatic 5x redial. **Scan:** 300dpi optical, 1200dpi enhanced. Includes OCR software. **Copy:** Reduce, enlarge or make full-size multiple colour copies. Up to 99 copies from one original. Makes B&W copies independent of the PC after setup.



**PRICE
DROP**

(55544)

\$817

HP OfficeJet Pro 1170C / 1175C *Print, copy, scan, all in colour!*

Features PhotoREt II



From

\$1,375

(63098)

The easy to use All-in-One that provides professional quality and performance for the discerning customer.

Print, copy, scan, all in colour!

Both OfficeJets feature a versatile flatbed that lets you easily scan and copy a wide variety of documents, pictures, books and other objects.

They print 9ppm black, and 5ppm colour. Copying is made easy with auto-enlarge, poster, mirror and clone features.

The 1175C model also includes integrated PC faxing and has a 30-page automatic document feeder to make scanning a multiple page document a breeze.



Smart Scanners! Sharp Results!

HP Scanjet 4100C

The easiest scanner
for home

- Guided workflow for quick results.
- One-touch scan and copy buttons.
- Easy to set up and fast operation with USB.
- Resolution: 600dpi Hardware Super Sampling, 1200dpi enhanced.

**PRICE
DROP**



(67196)

\$296 **USB
INTERFACE**

HP ScanJet 5100C



Best productivity
for business

- Fast scanning
- Scan line art for enlargement with no loss of quality
- Easy to use
- Enhanced Parallel Port
- Resolution: 600dpi Hardware Super Sampling, 1200dpi enhanced.

(56446)

\$465

HP Scanjet 6250C

Best image quality and
maximum productivity
for professionals

- A powerful networkable scanner for high workgroup productivity
- Integrated automatic document feeder for multi-page scanning
- USB/SCSI capable
- Resolution: 1200dpi Hardware Super Sampling, virtually unlimited enhanced resolution



(66185)

\$957 **USB
INTERFACE**



HP Scanjet 6200C

Network
ready
Slide adapter

**USB
INTERFACE**

\$755

(66184)

STOP PRESS!



Scanjet 6200C
with OEM
ADOBE
PHOTOSHOP
5.0 !!

\$1,356

(71635)



Scanjet 6250C
with OEM
ADOBE
PHOTOSHOP
5.0 !!

\$1,497

(71636)



Scanjet 6250C
with
Omnipage
Pro 9.0

\$1,210

(70707)

HP Scanning Technology at a glance

Features of Intelligent Scanning Technology	4100C	5100C	6250C
Push button scanning	✓	✓	✓
Dual image scanning	✓	✓	✓
Auto descreen/deskew	✓	✓	✓
Integrated OCR	✓	✓	✓
36-bit colour image processor	✓	✓	✓
Scan direct to application (drag & drop)	✓	✓	✓
Line art enhancement		✓	✓
Preview outline by region type		✓	✓
Auto page format retention		✓	✓
HP PrecisionScan LAN for network sharing			✓
Intelligent Assistance			✓
Unlimited enhanced resolution			✓
Advanced imaging controls			✓
35mm slide scanning			✓

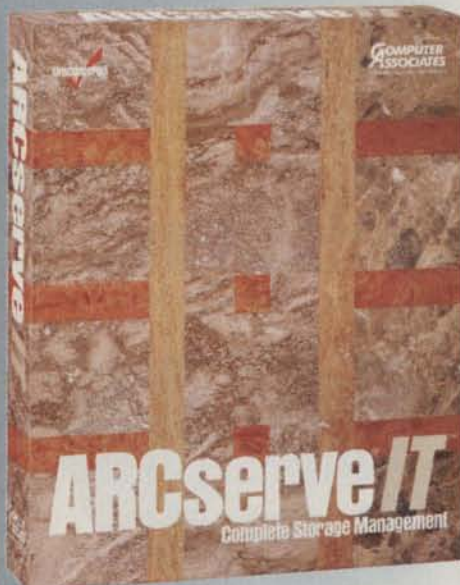
A HP scanner
with Photoshop 5.0?
That's the perfect
combination!



Go For **IT**-Management software

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ARCserve® IT™ Backup/Storage



● **ARCserve® IT™ Workgroup Edition** is a backup / restore solution for homogeneous Windows NT environments. It performs backup/restore operations for local Windows NT Server data, and connected Microsoft Windows 3.1x, Windows 95 and Windows NT Workstation desktops.

(71074) **\$794**

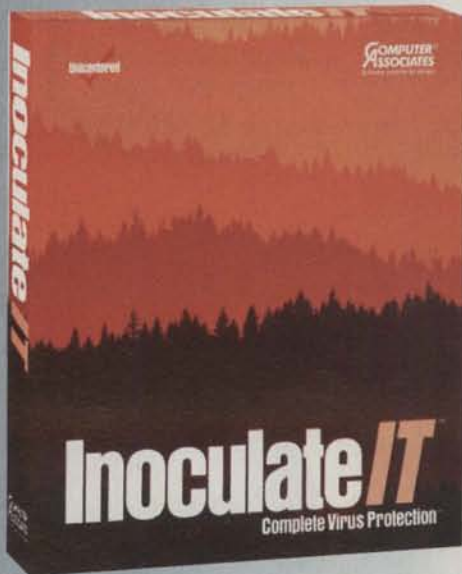
● **ARCserve® IT™ Pro Pack** You must already have ARCserve® IT™ Workgroup Edition. Provides a comprehensive, centrally managed integrated storage management platform for heterogeneous enterprise, delivering leading edge backup, restore and disaster recovery. With end-to-end data compression and encryption, automatic media management, built-in data migration and virus scanning, and powerful options, like library support; RAID; Image backup; open file backup; backup to mainframes; disaster recovery; application backup; and client backup; ARCserve IT sets the standard.

(70478) **\$924**

● **ARCserve® IT™ Netware WorkGroup** protects your most critical business asset...data. This world-leader in backup / restore technology delivers record-breaking performance, easy administration and unsurpassed reliability. Extensive suites of options offer additional client/server support and on-line backup of business applications and fast disaster recovery.

(71075) **\$998**

Inoculate IT™ Virus Protection



● **Inoculate IT™ Workgroup Edition** is the premier antivirus solution for Windows NT networks offering unmatched enterprise management and virus protection. Exclusive features of Inoculate IT include Real-Time Cure, Universal Manager, Virus Wall, Virus Quarantine, Hands-Free Updates, Extensive Alerting Options, Support for Windows NT 4.0, Internet Web Browser Integration and Messaging Protection.

(70492) **\$740**

● **Inoculate IT™ NetWare Workgroup Edition** is the premier antivirus solution for heterogeneous networks offering unmatched centralized enterprise management and virus protection. Exclusive features of Inoculate IT include Real-Time Cure, Universal Manager, Virus Wall, Virus Quarantine, Hands-Free Updates, Extensive Alerting Options, Internet Web Browser Integration and Messaging Protection.

(71077) **\$567**

● **Inoculate IT™ for NetWare** is a powerful client/server anti-virus solution certified by the International Computer Security Association to detect 100% of virus known to be infecting computers today. Inoculate IT runs on NetWare 3.x, 4.x and 5.0 servers, and fully supports NetWare Directory Services (NDS) which greatly simplifies maintaining a virus-free network.

(71076) **\$1,135**

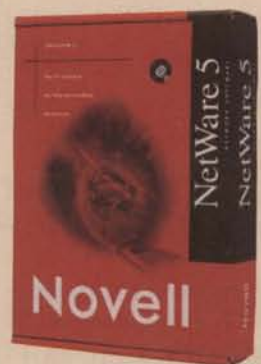
Affordable, Reliable Networking



NetWare® FOR SMALL BUSINESS

NetWare for Small Business provides the most affordable, reliable solution for networks of 25 users or less. It's easy to install and features the Novell Easy Administration Tool™ (NEAT), which simplifies adding users, groups, printers and applications, thus allowing the network to be administered with little or no training. It provides network faxing, backup and virus protection. It features GroupWise for E-mail, calendaring, scheduling, task management, and document management. The GroupWise Universal Mailbox allows you to manage all your information at one familiar, easy-to-use place. GroupWise puts you in touch with the people and information you need anytime, anywhere.

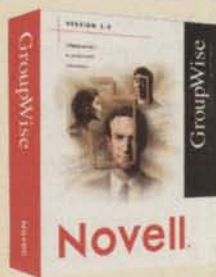
(23327) NetWare for Small Business 4.2 Server + 5 User License	\$1,999
(23333) 1 x User License	\$119
(23338) 5 x User License	\$545
(23342) 25 x User Lic.	\$2,694
(23344) Upgr. Server + 5 User Lic.	\$1,079
(23345) Upgr. Server + 5 User Lic.	\$1,539
(23349) Upgr. Server + 5 User Lic.	\$2,599



Novell® NetWare. 5

NetWare® 5 is the #1 network for Internet-enabled businesses. Through NDS, it provides centralised management of entire heterogeneous networks, from applications to the Internet-delivering an average 69 percent savings in administrative costs over non-directory-based systems. It supports open standards, including pure IP for increased network bandwidth (throughput) and faster performance. With proven network reliability, it offers users up to 23 days a year more server uptime over application servers. In all, NetWare 5 simplifies network and desktop management, consolidates protocols and operating systems, runs next-generation distributed applications, and delivers next generation file, print and web services - all at the lowest total cost of network ownership.

Item	Full Product	Upgrade
NetWare 5 Server Plus with 5 user License (66206)	\$1,695	(66212) \$819
NetWare 5 Additional 5 user Licenses (66207)	\$1,385	(66213) \$698
NetWare 5 Additional 10 user Licenses (66208)	\$2,049	(66214) \$1,019
NetWare 5 Additional 25 user Licenses (66209)	\$3,769	(66215) \$1,953
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GroupWise®

GroupWise is the easiest to use, lowest cost-of-ownership collaboration product on the market. GroupWise expands E-mail with integrated features such as calendaring, scheduling, and document management. GroupWise collaboration allows you to easily gather, access, and communicate business information.

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25 User Mailbox (58658)	\$5,472	250 User Mailbox (58656)	\$50,750

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For pricing details relating to NetWare 5 100+ user licenses or upgrades, view the Web-Direct link OR call us.



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Visio Enterprise



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(72085) 10 User: **\$13,158**

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IntelliCAD 98



The smart, new choice for CAD professionals

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(58629) 10 User: **\$3,998**

Offers unparalleled Autodesk AutoCAD compatibility, smooth Microsoft Windows integration, and a host of productivity features.

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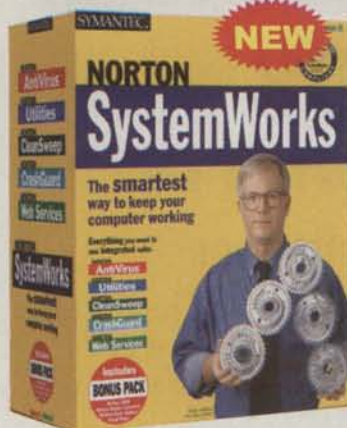
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PACK** worth \$500



(67223)

\$197

Norton SystemWorks

5 powerful utilities to fix and prevent PC problems

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The Bonus Pack includes Norton 2000™ to make your PC and data "millennium ready", Norton Mobile Essentials™, WinFax™ Basic Edition and Symantec Visual Page™.



(70217)

\$65

Norton 2000

Save your valuable pc and data from Year 2000 crises! Norton 2000 finds potentially damaging dates in spreadsheet and database data. Tests and fixes system BIOS and clocks. Checks desktop applications for Y2K compliance. Automatically updates database of Y2K-compliant software. Supports central installation administration.



(67197)

\$82

Norton AntiVirus 5.0 Gold

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(67203)

\$227

TalkWorks Pro 2.0

If you need voice mail, message notification, call tracking, or fax on demand, TalkWorks gives your home office/small business a professional voice. Set up separate mailboxes for employees, use pre-recorded greetings, remote notification via pager or cell phone when a voice or fax message arrives, and much more.



(67201)

\$134

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The fast PC cloning solution. Reduce PC roll out and upgrade times by 90%! Call for licensing info and pricing.

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(52653)

\$195

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\$150



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Voice Input - Speech Recognition



ViaVoice 98 EXECUTIVE

Powerfully Useful Speech Recognition

- Dictate directly into **Ms Word 97** and the most popular MS Windows applications, using normal continuous speech. Create text faster than most people can type.
- Use the power of your voice to create reports, presentations and spreadsheets quickly.
- Say **numbers, currencies, dates** and **prices** normally and they appear in the correct format.
- Enjoy high recognition accuracy - ViaVoice 98 uses 3-word context checking to help it recognise the words you dictate.
- Create "VoiceText" dictation macros to insert standard paragraphs without having to stop dictating.
- **Control your PC** by launching programs with your voice. Say file names, toolbar buttons, and icon names with "Say What You See" navigation.
- **Switch** between commands, correction and dictation quickly, easily and naturally, thanks to the new modeless operation.

Be more productive than you
thought possible... With all-new
ViaVoice 98 EXECUTIVE!
You Talk. It Types.

(67207)

\$239

ViaVoice HOME

- Direct dictation into Microsoft® Word 97
- ViaVoice Outloud - reads documents aloud eg email to user
- Context recognition
- Audio playback
- Shortcuts - to insert standard paragraphs/phrases etc



(70329)

\$88

PC Voice Control using normal continuous speech

- Large vocabulary of 64,000 words. You can add another 64,000
- 240,000 word backup dictionary
- Multiple user and multiple environment support
- Microphone, CD software, Command reference card and user guide supplied

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Business & Marketing Plans The Easy Way



- Save 50-90% of the time to prepare a plan!
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- Includes a simple step-by-step tutorial.

(36814)

\$189

Consultant's Pack

Used by thousands of accountants!



(34322)

\$479

The MAUS Consultant's Pack gives you the forms, tools and know-how to establish a Business Planning Consultancy.

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Other
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product

MAUS
Action
Planner
(69168)

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(34334)

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Performance Review

Write employee reviews in minutes!



(34337)

\$189

Regular employee reviews will help you maintain a happy, productive and motivated team. Simply choose from the dozens of performance criteria such as initiative, leadership, job knowledge, problem solving ability, and sales skills... to name just a few! Next, use the simple 1-5 grading system to rank your employees in each area.

MAUS Performance Review will then support your ratings with clear, effective text... it's that fast. It's that easy!

MAUS
Master Plan
Standard
(36813)

\$110

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products

Debt Collector

Turn your debts into cash!



(70170)

\$189

**NEW
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- Reduce bad debts
- Cut collection time and costs
- Automatically sends 30, 60, and 90 day reminder letters
- Stand alone contact manager stores all debtor details
- Includes professional letters, legal documents and advise.

MAUS Debt Collector is a complete debt collection system which automatically mail merges reminder and demand letters, reminds you of phone calls and action to take, and prompts you step-by-step through the entire debt collection process.

Stockmarket Plus

Manage, monitor & grow your investments



(69169)

\$189

**NEW
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Use MAUS Stockmarket Plus to generate instant profit/loss reports allowing you to test the profitability of different investment opportunities and even provide a tax assessment of your investments!

Some of the key benefits:

- User friendly with comprehensive help functions
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Speech recognition - PC control

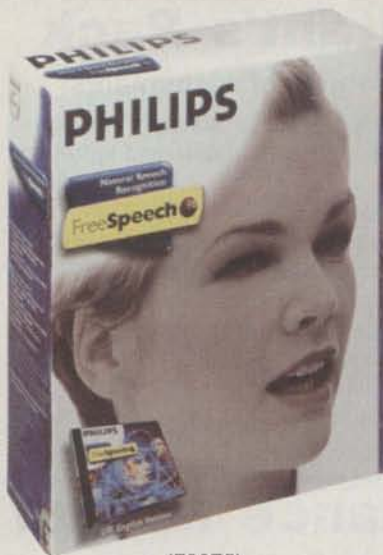
Philips Speech Mike™



Trackball, microphone and speaker in one hand-held device. There's no need for a headset mike, or a flat surface to work on. No need for special software. Great for "laid-back" Internet surfing!

(72077)

\$154



(72075)

\$69

**Speak instead of type
with FreeSpeech 98**

FreeSpeech 98

Natural speech recognition software that offers complete control over your PC using nothing more than your voice.

It's time to have a serious conversation with your PC. With Philips FreeSpeech 98, just tell it what you want and there it is. It's easy to install and easy to use. Using only your voice, you can:

- Create, edit & format documents, letters, e-mails, presentations etc.
- Navigate through your desktop and control applications
- Create or respond to e-mail
- Talk to discussion groups on-line

FreeSpeech 98 adapts to your voice, dialect and natural dictation style, becoming progressively faster and more accurate in its recognition of your speech. A unique synchronous playback feature audibly plays back words and sentences while simultaneously highlighting the selection.

This innovation allows you to overwrite and insert dialogue instantaneously - all hands-free. FreeSpeech 98 features a 27,000-word active vocabulary, customisable to up to 64,000 words.



(72076)

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**Free yourself from
the restraints
of the mouse!**

FreeSpeech 98 with SpeechMike™

For best results, use FreeSpeech 98 with a microphone specifically designed for speech recognition such as the Philips SpeechMike™, the revolutionary trackball, microphone and speaker in one hand-held device.

Now you can sit back and input your voice for natural speech recognition, PC command and control, voice mail, Internet telephony, video conferencing, video editing and photo archiving.

FreeSpeech 98 with SpeechMike™ gives power to your voice!

- SpeechMike™ is ergonomically designed
- Control your PC with SpeechMike™'s trackball
- Input speech through SpeechMike™'s microphone
- Listen to your PC through SpeechMike™'s speaker
- SpeechMike™ can be used as a standard mouse
- Navigate and control Windows® 95/98 and NT applications

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Office 97 - Upgrade to Office 2000

Microsoft Office 97

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Providing the basics for better productivity, Office 97 Standard Edition includes Microsoft Excel, Word, Outlook, PowerPoint, and more.

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(59664)

Microsoft Office 97 VALUE PACK



\$592

Includes all of the following great software for one low price: **MS OFFICE PRO 97 Upgrade** - integrated suite of essential business tools: Word 97, Excel 97, Outlook 97, Powerpoint 97, Access 97. **PUBLISHER 98** - the worlds leading business desktop publishing application. **ENCARTA WORLD ATLAS 98** - a comprehensive multimedia geographic atlas. **MONEY 98** - task oriented program to manage personal finances. **GREETINGS WORKSHOP DELUXE** - Create great multimedia greetings for the Internet or email. **INTELLIMOUSE** - one step zoom and scroll features in Office 97 applications. **SYMANTEC NORTON ANTIVIRUS 4.0** - eliminates viruses from networks, floppy disks, hard disks, email attachments, CD-ROMs & Internet downloads.

OFFICE 2000

Technology Guarantee

Free* upgrade to Office 2000

The Technology Guarantee allows customers in Australia to purchase any Office 97 application and get the corresponding Office 2000 application, when available, for the cost of shipping and handling.

In addition, you may get an upgrade to Office 2000 Premium when you purchase the following products: Office 97 Professional FPP and either PhotoDraw or FrontPage (send in proof of purchase), Office 97 Value Pack, Office 97 Professional FPP (send in a cheque for \$150).

Office 2000 Premium contains the following 8 applications: Word, Excel, PowerPoint, Outlook, Publisher, Access, FrontPage and PhotoDraw.

*Conditions apply. Postage & handling fee applies. Offer ends July 31 1999. Offer applies to packaged product ONLY. Upgrade offer applies to the following products ONLY: Office Suites: Microsoft Office 97 Value Pack, Microsoft Office 97 Professional Edition, Microsoft Office 97 Small Business Edition, Microsoft Office 97 Standard Edition and Microsoft Office 97 Developer Edition. Standalone products: Microsoft Word 97, Microsoft Excel 97, Microsoft PowerPoint 97, Microsoft Access 97, Microsoft FrontPage 98 and Microsoft Publisher 98.

See this website for more details: www.microsoft.com.au/australia/office/cb or call Microsoft on 13 20 58.

**\$50
CASH
BACK**

Purchase any of the following Office 97 products and you will get \$50 cash back from Microsoft:

Microsoft Office 97 Value Pack, Microsoft Office 97 Professional Edition, Microsoft Office 97 Small Business Edition 2.0, Microsoft Office 97 Standard Edition and Microsoft Office 97 Developer Edition.

But don't wait too long, because this offer ends April 1 1999.

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Check for Year 2000 issues

Audit the
Millennium
Bug while
you still
can!

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information

What is the Year 2000 Bug?

This refers to storing the year-date field as two digits, so that the year 97 refers to 1997. The problem is that many products in use worldwide will recognise the year 00 as 1900, not 2000. This problem can apply to lifts, aircraft, building security systems, and of course computer hardware and software.

Is it Serious?

Yes, it will cause many products to cease to function properly. Many programs will fail to work at all and many will cause errors in calculations which are date related.

Can I just set my computer to 00 to test it?

You probably should not do this as it may permanently corrupt data or cause a program licence to de-activate the software. Also be careful with other non-computer devices.

Which computer products are more likely to have the Yr2k bug?

Older hardware and software. For example most 486

PCs or earlier, many of the early Pentium PCs 60/75/90 etc. Most software created throughout the 60s, 70, and 80s will have the bug, and much of the software created in the 90s.

How can I find out more?

Research as much as you can as quickly as you can. The problem is urgent for many companies. There are many articles in the press, and our Harris web-site points you to a wealth of information from IBM, Microsoft, Toshiba, and many other sites.

Can I avoid this problem?

By taking action you may, but by doing nothing you are taking a great risk.

For more information...

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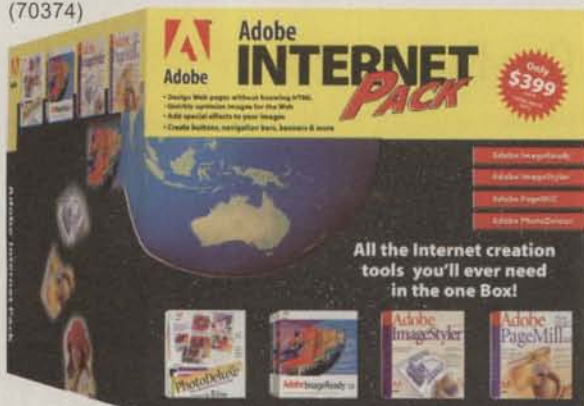
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(70374)



Adobe INTERNET PACK

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- Quickly optimize images for the Web
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- Create buttons, navigation bars, banners & more

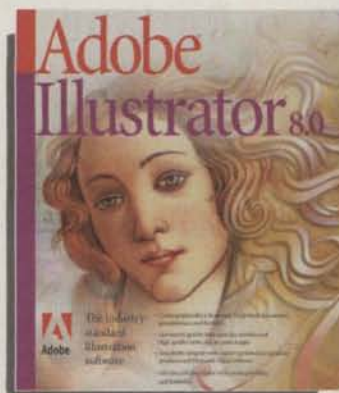
Four Adobe Internet creation tools in the one box!

- ImageReady® 1.0** Streamlined image processing for the Web professional
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Value: **\$820**

Special price:

\$375



Adobe Illustrator® 8.0

The world's
best drawing
program just
got better!

The industry-standard illustration software, preferred by designers, graphic artists, technical illustrators, and business professionals around the world.

Its time-saving features and superior integration with Adobe Photoshop®, ImageReady® and PageMaker® as well as drag-and-drop convenience with Microsoft Office and other graphics applications, help you create eye-catching artwork for print, presentations, and the Web in an exceptionally smooth workflow.

New
version

(67039)

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(60923)

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6 products
in 1

Great Value!

Includes the following great Adobe products:

- PageMaker® 6.5** Professional page-layout software
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- Illustrator® 8.0** Industry-standard illustration software
- Acrobat® 3.0** The fastest way to publish any document online
- Streamline® 4.0** Convert images to line art
- Dimensions® 3.0** Powerful 3D rendering tool

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they would cost over
\$3,500!

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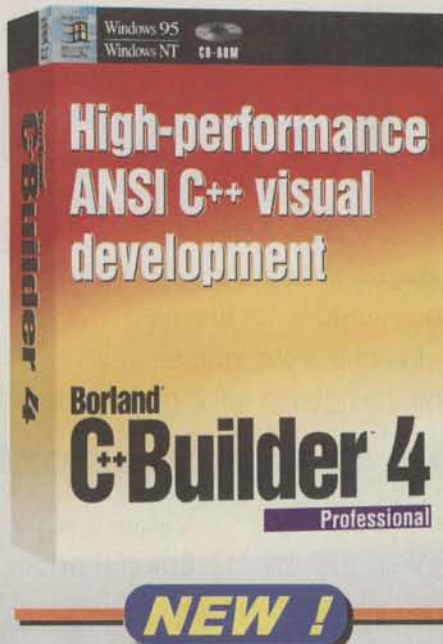
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Solutions for software developers



Borland C++Builder 4

Professional:

(xxxxx)

\$Call

C++Builder 4 Professional is the fastest, most powerful ANSI C++ development environment for building high-performance Windows client applications. Simplify the development of Windows client applications, reduce development time and rely on the stability and maturity of ANSI standard C++. Deliver solid solutions far faster than any other C++ tool with C++Builders next generation, true-visual and fully customizable AppBrowser IDE.

Enterprise:

(xxxxx)

\$Call

C++Builder 4 Enterprise is the fastest, most powerful ANSI C++ development environment for building high-performance COM and CORBA distributed solutions. Simplify the development of complex distributed solutions, reduce investment risk with a proven language, middleware flexibility and rely on the stability and maturity of ANSI standard C++. With C++Builder you deliver solid solutions faster than any other C++ tool.

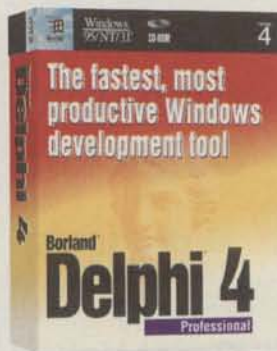
**Delphi 4
Professional
Upgrade:**
\$442
(30468)

**Client/
Server
Upgrade
from C++
Professional:**
\$3,478
(66198)

**..from C++
CLS:**
\$2,635
(66199)

**JBuilder 2
Professional
Upgrade**
\$389
(62990)

**Client/
Server
Upgrade
from C/S**
\$2,785
(72282)



Borland Delphi 4

Any data.
Any time.
Any where.

Standard:

(66195)

\$172

Delphi 4 Standard is the easiest to learn, easiest to use, high-performance Windows development tool. Includes drag-and-drop visual programming, dockable toolbars and a visual component library of over 85 reusable components.

Professional:

(66196)

\$949

Delphi 4 is the fastest, most productive tool to build any Windows application. Includes 10 new debugging tools, a customizable IDE with Project Manager and complete support for Windows 98 and 95 development.

Professional Cross Grade:

(66197)

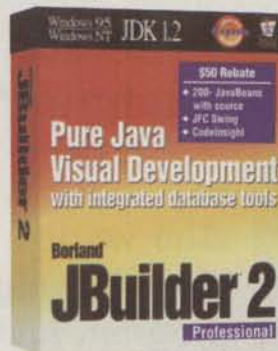
\$459

Client/Server Suite:

(64016)

\$3,778

Through its high productivity solutions for distributed computing, Delphi 4 Client/Server Suite gives you access to any data, any time, anywhere.



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easy to create industry
standard JavaBeans

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JDK Switching for com-
piling against the latest

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Standard:

(46936)

\$155

Professional Cross Grade:

(65319)

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Client/Server Suite:

(68388)

\$3,587

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- Megapixel (1152x864 pixels)
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- Built-in flash with red-eye setting
- 8MB Picture Card allows you to store up to **120** pictures before downloading

\$1,089 (67283)

Kodak DC220 ZOOM Digital Camera

- 2x optical, 2x digital focus free zoom lens 29-58mm
- MegaPixel (1152x864 pixels) for clear 5" by 7" prints
- 6 connection options, including **USB**



- 8MB (80 pictures) memory
- 2.0" TFT colour LCD
- Auto flash, red-eye reduction and more
- Take pictures as close as 8"

USB INTERFACE

(63347) **\$1,579**

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While stocks last and you get a

BONUS

CompactFlash Card Reader
worth \$140.00 ERP Inc Tax

Kodak DC260 ZOOM Digital Camera

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- 2.0" TFT colour LCD
- Take pictures as close as 12"

USB INTERFACE

(63348) **\$2,139**

Kodak 4801 CD-Writer

- Works as a normal CD-ROM drive as well as a CD recorder
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- 8x read, 4x write
- Recording method: Track-at-once, Multi-session
- Buffer: 2MB
- Software: CeQuadrat ToGo! and Packet CD software
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(68740)

\$559

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- (34930) Present./Communication Kit Business
- (72231) InkJet T-Shirt Transfer Media
- (72233) A4 InkJet Photo Paper Pic Easy 15 Shts
- (72232) A4 InkJet Photo Greeting Card 20 Pck
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- (62676) Photo Memory 20MB (suit 220 & 260) **\$ 319**
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but when purchased with a new computer only

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Save \$76

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(69969)

\$275

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(Parallel 70568)
(USB 70567)

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(USB 70566)

\$285



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(60332)

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(54912)

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Deluxe 104 Keyboard



(60467)

\$49



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- Convenient Windows 95 "hot keys" provide instant access to the start and contextual menus
- Detachable palm rest give you new choices for comfort and extra flexibility
- 3 Year Warranty

FEBRUARY

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HARRIS

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Several finance methods available, subject to approval



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Accomplished computer artists in tune with the illustration world depend on CorelDRAW™ time and time again.

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(72048)

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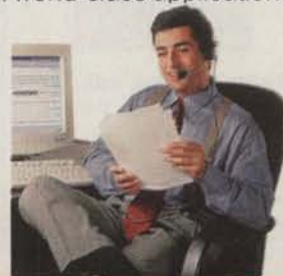
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With **Math Blaster Ages 4-6**, consists of 5 arcade games keeping learning math problems fun and easy.

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Ready to Read with Pooh has fun activities to teach and enforce different essential reading skills.

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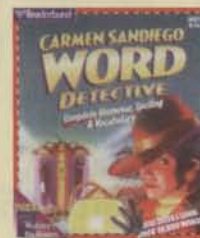
Math Blaster Ages 6-9 4 action packed learning games boost mental math, problem solving skills into the stratosphere.

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	Harris TechnoRent	\$57.78 (Inc Stamp Duty)	36	\$9,013	\$970
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	Harris TechnoRent	\$38.82 (Inc Stamp Duty)	36	\$6,055	\$653

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February 1999 Issue



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Scanner
only \$149**

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**New
USB ZIP**

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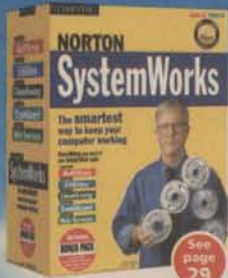
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**Free Bonus
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worth of
software**

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Phil Webb

Phil Webb
Managing Director



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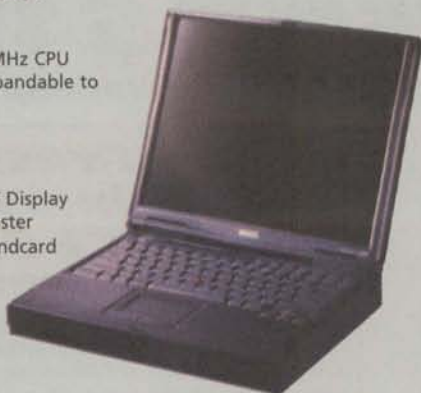
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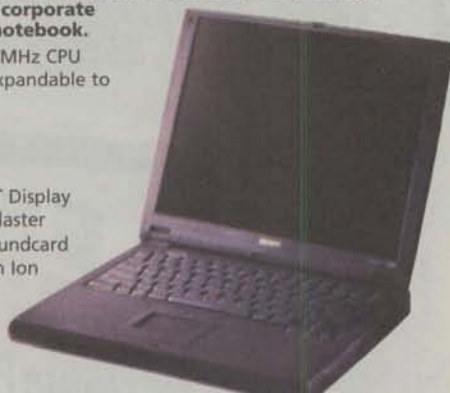


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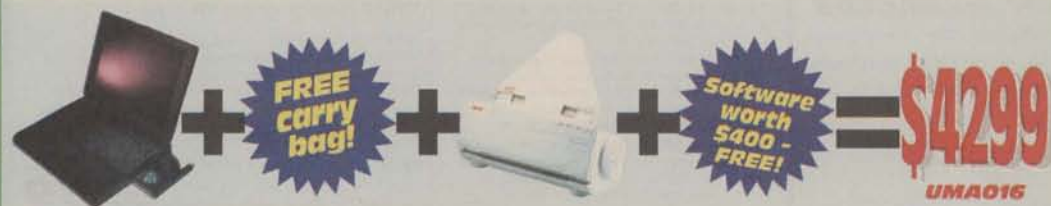
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- Win NT4 workstation licence + Win 95 on CD
- HP Top Tools software

Excludes Monitor

HP Vectra VE8 350 HPV002\$2599

HP Vectra VE7

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- 3.2Gb Ultra ATA HDD
- 2Mb AGP graphics card
- 3COM 10/100TX remote wakeup network card
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Excludes Monitor

HP Vectra VE7 HPV001\$1949

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- 64Mb SDRAM
- 3.2Gb Ultra ATA HDD
- 4Mb SGRAM graphics card
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EPS330 EPSON Stylus Color 740

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The 1440dpi Photo Printer for home printing needs!

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Now you have THE POWER TO CREATE.

EP5312 EPSON Stylus Photo 700

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High Performance, High Quality

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Stunning Quality

EP5315 EPSON Stylus Color 850

\$639



EPSON Stylus Photo EX

A3 Photo Quality Printing

With A3 Photo Reproduction Quality as standard, 1440 x 720 dpi resolution and 6-colour QuickDry inks, the EPSON Stylus Photo EX is the ultimate photo printer. It uses the latest technology to produce true photo quality output - up to A3 in size, max print width is 297mm making it the perfect colour printing solution for photographic enthusiasts, graphic designers and in-house publishers.

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A3 6 Colour

EP5316 EPSON Stylus Photo EX

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BJC-255SP Super Performance, Brilliant Colour.

Features

- Super Economy mode to cut operating costs.
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- Print up to 2400 pages in B&W and 600 colour pages per cartridge.
- Photo Mode for spectacular plain paper colour.
- Gold standard photographic printing with optional PhotoRealism inks.
- Plus better Internet printing for images and text.



CAN235 Canon BJC-255SP Printer

\$165

BJC-80

Uses half your briefcase not half your desktop!

- Drop Modulation Technology™ - the dual drop size breakthrough that produces smoother colour gradations.
- Office laser quality finish and B&W speeds up to 4.5 pages per minute with dedicated black cartridge.
- Better Internet images with Image Optimiser.
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- Fits in half a briefcase, weighs only 1.4Kg!
- International warranty included with purchase.



CAN001 Canon BJC-80 Portable Printer

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BJC-4310SP

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BJC-4650

- Full colour printing up to A3 - for CAD, DTP and design work.
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Optional colour scanhead available CAN099 \$149

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HPP019 HP DeskJet 1120C **\$839**

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HWP346 HP DeskJet 710C **\$339**

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 - colour print cartridge
 - printer software
 - user's guide



HWP365 HP DeskJet 695C **\$289**

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HP LaserJet 1100

It's the new, improved personal laser printer standard

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HWP257 HP LaserJet 1100 **\$799**

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Visual Basic 6.0 Build powerful applications fast!

Microsoft Visual Basic 6.0 is the most productive tool for quickly creating fast business solutions. With its Rapid Application Development (RAD) environment, developers can quickly create and deploy super-fast client/server applications - plus easily develop Web applications using familiar Visual Basic programming techniques. Visual Basic is the leader in RAD with its visual user interface (UI) designer providing developers with intuitive drag-and-drop UI

creation. No tool is more RAD, easier to design GUIs with, or has more commercially available third-party components, controls, and tools associated with it. Visual Basic has many pre-built components and fast creation of custom components that can be either client or server based. With IntelliSense technology, you don't need to memorise commands or language syntax. Just type a portion of the word, and Visual Basic does the rest.

MSS057 Vis Basic Std 6.0 Learning **\$169**
MSS058 Vis Basic Pro 6.0 **\$839**

MSS059 Vis Basic Pro 6.0 U/G **\$429**
MSS060 Vis Basic Ent 6.0 **\$2049**
MSS061 Vis Basic Ent 6.0 U/G **\$1199**



Visual J++ 6.0



The power of Windows Microsoft Visual J++ development system for Java version 6.0 lets you harness the productivity of the Java language and the power of Windows to build and deploy high-performance, client/server solutions for Windows applications. Visually design, debug, and deploy feature-rich application from within the high productivity RAD environment. Use Visual J++ alone, or as a complement to your existing tools, to accelerate development of powerful applications, components, and middle-tier business rules.

FROM \$169

Key Features

- The high-productivity RAD environment, similar to that found in Microsoft Visual Basic, offers two-way visual design of high-performance, client/server solutions for Windows and the Web.
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SQL Server 7.0 is the leading Windows database bringing business advantage and improved decision-making to all levels of the organisation through the power of data warehousing, scalable business solutions and interoperability with Microsoft Office.

Key Features

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- Bringing faster and better decision making through Data Warehousing
- Empowering employees via Integration with Office and Windows family

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Visual C++ 6.0

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Nearly all contemporary world-class software, including the leading Web browsers, Internet servers, databases, and office productivity suites are built with the Microsoft Visual C++ development system.

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FROM \$169

Key Features

- For faster turnaround, make changes during your debugging session and continue on without rebuilding
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MSS066 Visual J++ 6.0.....

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Microsoft Visual Studio 6.0

Product/Components	Description	Pro.	Ent.
Microsoft Visual Basic 6.0, Visual C++, Visual FoxPro 6.0, Visual InterDev 6.0, Visual J++ 6.0, MSDN Library Special Edition	The complete suite of Microsoft Visual Tools.	•	•
Enterprise Visual Database Tools	Visually design databases and views, and create and test stored procedures for Microsoft SQL Server 6.5+ and Oracle 7.0+ databases.		•
Microsoft BackOffice 4.5 Developer Edition (for Windows NT only)	Build Windows NT-based solution that can be accessed from Windows-based or Web-based clients and integrated in enterprise environment with selected server technologies form the Microsoft BackOffice family. The Development License for Microsoft BackOffice Server 4.5 includes Microsoft SQL Server, Microsoft Exchange, Microsoft SNA Server, Microsoft Site Server, Microsoft Systems Management Server and Windows NT Server.		•
Team Support	Microsoft Visual SourceSafe version control system version 6.0, Visual Component Manager, and Microsoft Repository.		•
Application Design Tools	Design multi-tier applications with Visual Modeler.		•

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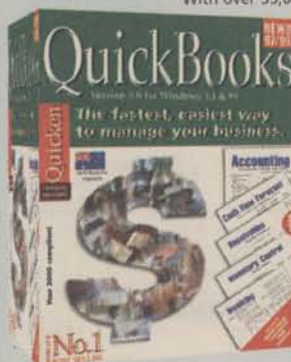
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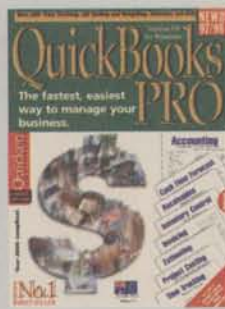
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reports you need are right there.

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Which one is right for you	QuickBooks Small Businesses & Home Offices	QuickBooks Pro Small Businesses that TrackTime & Projects
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Cheque Accounts and Credit Cards	Yes	Yes
Write and Print Cheques	Yes	Yes
Business Reports and Graphs	80	90
Accounts Receivable	Yes	Yes
Accounts Payable	Invoices affs	Yes
Statements	Yes	Yes
Inventory and POs	Contact	Yes
Management Features	Yes	Yes
Audit Trail	Yes	Yes
Job costing and budgeting	Basic	Advance
Estimates and Bids		Yes
Time Tracking		Yes

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KENS KORNER

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DRG003

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DRG004

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- New, Even Larger Vocabulary - 42,000 active words (230,000 total)
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ViaVoice 98 Executive The Premier Continuous Speech System From IBM

ViaVoice 98 Executive is the essential tool for productivity. Create letters, e-mail, reports, proposals, plans... all with the power of your voice.

Powerfully Useful Speech Recognition

- Dictate directly into Microsoft Word 97 and the most popular Microsoft Windows applications, using normal continuous speech. Create text faster than most people can type.
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NEW Key Features:

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- Use intuitive natural Language Commands in Microsoft Word 97 for easy formatting and editing. You can create documents, insert tables, change fonts, move paragraphs and print the perfect document. For example, when you want to insert a table, pause and say, "Insert a table with three rows and four columns".

Proof-reading And Editing Made Easy

- Playback your dictation in your own voice to help you make corrections.
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- Have your text or e-mail read back to you with ViaVoice Outloud text-to-speech.

Simple Set-up

- Perform the short optional (recommended) enrolment to teach the system the sound of your voice.
- Find what commands you can say just by asking, "What can I say?"
- Set the system for use in different environments, or by more than one person on the same PC.
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- Expand the 56,000 word UK English base vocabulary with up to 64,000 personal words.
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Includes
Lightweight, Noise
Cancelling
Microphone



For Windows 95,
Windows 98 & NT

\$239
\$99

IBM080 IBM ViaVoice 98 Executive

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Voice Recognition

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Why dictate that way? Continuous Speech VoiceDirect products learn to interpret the way you speak naturally - not one word at a time like discreet products. And using industry-leading ViaVoice technology, VoiceDirect is as accurate as any speech recognition software you can buy!

Perfect for professionals in small business and corporate settings, writers, power users, and mobile PC users needing a powerful and complete speech recognition solution that allows for the operation of command and control functions.

Key Features:

- Fast, continuous speech recognition with no pausing between words
- Voice command and control of the Windows desktop
- Voice command and control of Microsoft Word
- Word recognition that eliminates spelling errors
- Transfer dictation directly into popular programs with a mouse click
- User Wizard for quick orientation
- Keyword shortcuts to trigger commonly used phrases, addresses, etc.
- IBM's multi-patented industry-leading technology
- Context recognition to distinguish between similar-sounding words and phrases
- Text-to-Speech feature that reads compositions and imported text aloud
- Base vocabulary of 22,000, expandable and customisable to 64,000 words
- Plus, a 260,000 word back-up dictionary
- Save feature for convenient correction options
- Includes Premium noise-cancelling microphone

System Requirements:

- Pentium 166 MHz or 150 MHz with MMX
- Windows 95, Windows 98 or Windows NT 4.0
- 32MB RAM for Windows 95 & Windows 98, 48MB RAM for Windows NT 4.0
- 125MB available hard disk space
- Creative Labs Sound Blaster 16 or 100% compatible, or Mwave audio system
- Some laptops and sound cards may require a microphone battery adapter
- CD-ROM Drive

Note: VoiceDirect products support a variety of popular software including Microsoft Word 6.0, 95 and 97, PowerPoint 7.0, Excel 7.0, and Exchange; Lotus SmartSuite 97; Lotus 1-2-3; Lotus Notes 4.5; Corel Perfect Office 7; WordPerfect 7.0; and more.



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Plus--Command & Control, Text to Speech & More!

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Continuous GOLD

Stock Code:IMS142

IMSI

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- Standard Microphone
- UpdateNow (30 Day Trial)



IMSI

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VoiceDirect Continuous

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Key Features:

- Fast, continuous speech recognition-no pausing between words
- Transfer dictation directly into popular programs with a mouse click
- User Wizard for quick orientation
- Key word shortcuts to trigger commonly used phrases, addresses, even whole pages.
- Context recognition to distinguish between similar-sounding words and phrases
- Text-to-Speech feature that reads compositions and imported text aloud
- Base vocabulary of 22,000, expandable and customisable to 64,000 words
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IMS140 VoiceDirect Continuous Express

IMS141 VoiceDirect Continuous

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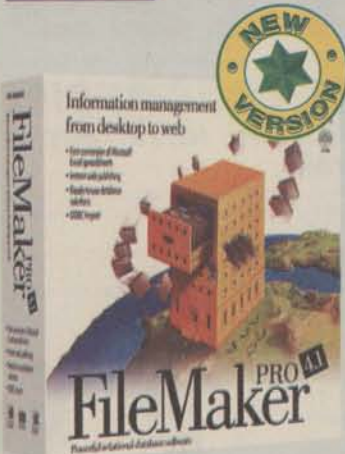
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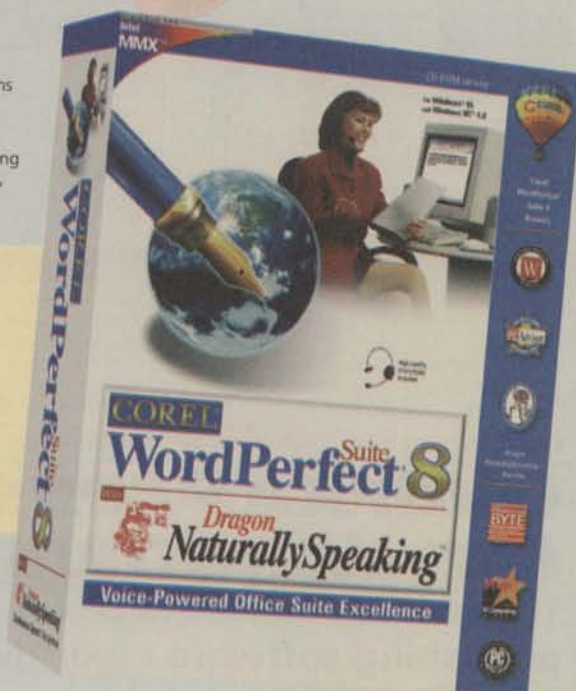
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Plus

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Dragon NaturallySpeaking Features:

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- Highly Accurate - typical accuracy: 95% up to 98%
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- Learns dialects, accents, and individual pronunciations quickly and automatically.
- Correct and edit anytime. Changes can be made as you go or later
- Text shortcuts - quickly insert frequently used phrases and sentences just by saying a single word or phrase.
- Plus much more!



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COR540 Corel Print Office

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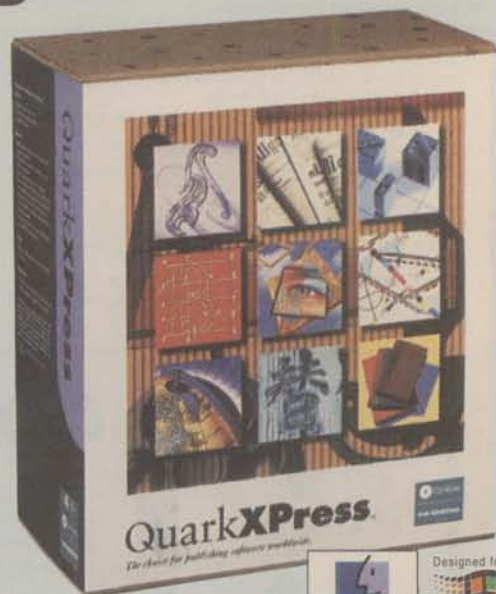
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QUA138 QuarkXPress 4.0 for Windows

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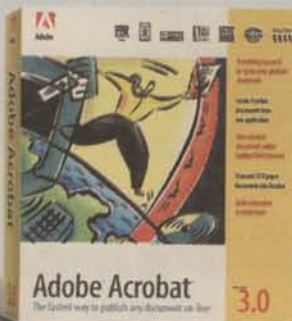
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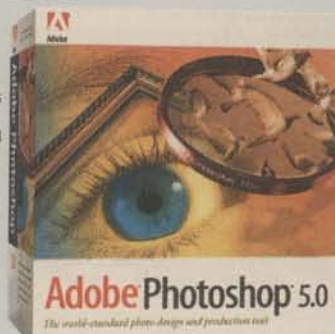
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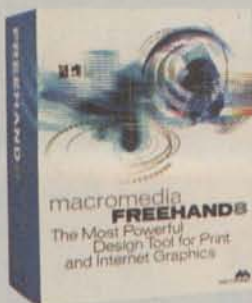
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Ken



FreeHand 8

The Most Powerful Design Tool for Print and Internet Graphics. Take your design further! With breakthrough creative effects like transparency, excellent performance, precision drawing, type control, and streamlined workflow, FreeHand 8 makes it easy to produce and publish high-quality graphics, illustrations, layouts, and animations. It offers the customisation, special effects, print quality, and animation capabilities you need to put your design in motion.



Features:

- Transparency, Magnify, Invert, Lighten & Darken Lens fills that you can modify at any time.
- Save time with Find & Replace Graphics.
- Instantly create special effects for print and the Web.
- Extensive customisation options and seamless integration with other design programmes.
- Modify shapes interactively with push-and-pull editing tools.

- Includes 10,000 updated pieces of clip art, 500 fonts, and templates.
- Modify shapes interactively with push-and-pull editing tools and intuitive transformation handles. Includes 10,000 updated pieces of clipart, 500 fonts, and templates.
- Lay out print projects, storyboards, or cel animations using the multipage environment.

MAC055 Freehand 8

\$789

MAC111 Design in Motion

\$899

Kai's Power Tools 5

Kai's Power Tools is the premiere collection of plug-in software tools for Adobe Photoshop and compatible host applications such as MetaCreations' Painter 5.5. You have seen KPT everywhere, whether you realize it or not, on thousands of Web pages, on TV and on countless CD and book covers. In the arsenal of any cutting edge designer, you will find KPT.

What can you do with KPT 5?

- Enhance your productivity with precise controls, real-time previews, and extensive presets
- Create compelling and easily reproducible Web graphics
- Explore fantastic textures, vast fractal vistas, complex 3D objects, and endless new permutations of radical image-altering algorithms
- Discover original, artistic possibilities beyond your imagination
- Apply corrective and creative effects to digital photos



MET027 Kai's Power Tools 5

\$329

Poser 3

The Remarkable Figure Design and Animation Tool. Poser 3 is a 3D figure animation and reference tool for digital artists and animators. From an included collection of human and animal models and props, create movies, images and posed 3D figures. The unique and powerful 3D feature set is easy for any user to master.

Features:

- All new, easy to use interface with the Meta look and feel.
- Incorporates MetaCreation's SREE-D acceleration technology.
- Animate facial expressions and hand gestures.
- Incorporate five animal models into your Poser scenes.
- Industry standard BVH Motion Capture for animating Poser 3 figures.

MET002 Poser 3

\$399

MET003 Poser 3 upgrade

\$199

All prices INCLUDE sales tax. Prices subject to change, see page 48 for terms & conditions.



Dream Team

Superbly Integrated Web Software

A premier production tool for Web Site designers has finally arrived! Macromedia are providing serious graphic and web designers the opportunity to work seamlessly through the graphic and production processes of web site creation - with HUGE savings to add.

Included in Macromedia Dream Team:

Macromedia Dreamweaver

- Stay in control of HTML source with Roundtrip HTML. HomeSite is integrated into the Windows version of Dreamweaver.
- Preserve existing HTML formatting when opening pages created with other editors.
- Animate HTML elements without scripting.
- Manage content across a site rather than page-by-page.

Macromedia Fireworks

- Work with any graphic type at any time or slice apart your Web graphics to mix compression types and file formats for the fastest downloads.
- JavaScript Rollovers - create impactful, graphic rollovers without writing any code, and assigning URL links to rollovers couldn't be easier.
- Create special effects like bevels, glows, embosses, and drop shadows that are completely customisable and editable.

Macromedia Flash3

- Designed for professional design, dynamic generation, and universal playback of graphics and animation on the web.
- Create translucent graphics, overlay transparent vector objects on bitmaps, and vary the levels of opacity.
- Easily morph, or change, any graphic across any number of frames.
- Create applications like animated buttons, checkboxes, hierarchical and pop-up menus.



SAVE OVER
\$750

MAC090 Macromedia Dream Team

\$949

MAC052 Dreamweaver

\$569

MAC105 Fireworks

\$569

MAC107 Flash3

\$569

Bryce 3D

It moves! Master 3D landscape design & animation in minutes.

Use Bryce 3D to animate just about anything in your scene. Start with hundreds of pre-set surfaces, objects and materials to add and animate realistic textures inside objects. Show clouds blowing within bubbles, molten lava spilling from craters or smoke swirling in beams of light. Bryce 3D is flat out the easiest tool for creating and animating 3D environments that mimic the natural world.

Features:

- Click to select from built-in object and material libraries.
- Customise or Import objects you create in other 3D modelling tools
- Export to most popular formats, including QuickTime and AVI movies
- Fast animation preview and QuickDraw 3D give you real-time feedback in you edit.



MET027 Kai's Power Tools 5

\$329



KAI013 Bryce 3D

\$379

Painter 5.5 Web Edition

A Powerful Digital Painting Tool for Creative Professionals. Indispensable for developing unique web content, Painter 5.5 Web Edition can produce hot looks fast. • Divide your images with precision to optimise download time of graphics. • Create buttons with a single click. • Design seamless tiled background patterns in an instant. • Compose and control text and assign URLs to any floating object. • Jump start your website with hundreds of ready made buttons, objects, photos, textures and patterns.

- Web-Ready Content:
- 600+ Web buttons
 - 300+ objects
 - 250+ horizontal rules
 - 325+ additional textures and patterns
 - 100+ royalty-free photos

- File Format Support:
- RIFF (Painter Native)
 - TIFF, GIF, JPEG
 - PICT, BMP, PCX
 - TARGA, EPS, PYRAMID
 - PhotoShop 2 & 3



MET002 Poser 3

\$399

MET003 Poser 3 upgrade

\$199

MET025 Painter 5.5 Web Edition

\$549

DON'T FORGET TO ASK FOR YOUR FREE GIFT

BladePro

The Ultimate Plugin. Create and Explore Touchable 3D Surfaces
Extend the power of your image editor today!

BladePro is a Photoshop compatible plugin that fits most image-editing packages. Create touchable 3D looks by applying finishes such as tarnish, iridescence, and glassiness for incredible results. Hundreds of presets give you eye catching, web buttons, and more, instantly.

Zap

BladePro offers custom textures, zoomable previews, new light sources, mutation, and more. BladePro comes complete with:

- Hundreds of Presets
- Heaps of Tutorials
- Online Links
- Tons of Textures
- Associated graphics tools to evaluate and more...

With BladePro you can quickly create:

- tarnished copper
- dirty brass
- reflective glass blobs with rainbow caustics
- chrome text that reflects it's environment
- oxidized metal with iridescent colours
- cracked paint
- eroded mud
- scaly plastic
- glittery aluminium
- rough stone
- your logo embossed into gold foil and much much more...



Stock Code: COM105

\$69

Paint Shop Pro

The Versatile Image Design Studio

Paint Shop Pro 5 is a complete image creation and manipulation program that enhances the imaging power of business and home users with unrivaled ease of use, speed and affordable functionality. To express your self with rich and arresting imagery, you need tools that offer innovative functionality and the flexibility to work in any setting without slowing you down. Whether you need to design corporate Web graphics or touch up a family photograph, Paint Shop Pro is the perfect program to express and enhance your visual creativity.

BONUS
FREE SOFTWARE
Animation Shop -
a fully featured
GIF Animator

New Features

- **Layers, Layers and More Layers**
 Complete layer support has been added. Layer functionality has been added to blend mode control, names, grouping, visibility, transparency locking, use masks, variable opacity, and mask looking.
- **Multi-level Undo**
 Change your mind at any time with PaintShop Pro's multi-level undo. There is even an undo history log.
- **Picture Tubes**
 The cool new Picture Tube feature gives you a host of stunning graphics at your fingertips, that can be added to any image.
- **FreeForm Deformations**
 Deform your graphic on the run with the new Free form tool.
- **Retouch Brushes**
 Retouch brushes now include dodge, burn, saturation, hue, lightness, and HSL to target modes.
- **Enhance browser makes it even easier to find your files.**
- **CMYK separations**
 Printing four colour separations is now available.

Perfect for graphic artists and pre press processing.

- **Pressure Sensitive Tablets**
 Paint Shop Pro 5 now includes pressure sensitivity for graphics tablets
- **ICM2.0 for Win98/NT5**
 Device independent colour management will be supported for Win 98 and NT 5.0. This will allow for consistent colour reproduction across devices such as scanners, monitors, printers.
- **Brush Palette**
 Additional brush settings along with an easy to use brush palette with preview window.
- **Custom Brushes**
 The Custom Brush feature allows for use of user defined brushes. A database of custom brushes can be created to store the brushes. The custom brushes created are compatible with Photo Shop's custom brushes.
- **Adjustable Cropping**
 An adjustable crop tool has been added allowing for a more precise control of the cropping procedure.



Stock Code: JAS009

\$135

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NIT020

...WITH HOME MOVIE DIRECTOR

Now you can produce a Video Family Album quickly & easily using just your camcorder & VCR. Developed by TV & film making professionals, this hit contains easy to follow handbooks & set up guides, script editor, video label printer plus a bonus instructional video & CD-ROM. Taking you step by step, learn how to capture all your most important family memories, then delight your family & friends with the results. This motion picture album is a must for all camcorder owners.

ONLY
\$69.95

For professional video editing, take a look at the Studio 400 on p43

Tamsin



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SURVIVE THE MILLENNIUM BUG!

Between February 1st, 1999 & March 31st, 1999 IMSI will be helping you get Year 2000 ready. We will be including a free CD copy (OEM version) of our survive the millennium bug product, Year 2000 Now, with all our products.

MasterClips 1,000,001

The World's finest and largest collection of top quality clip art.

Unbeatable access to the perfect image each and every time. MasterClips includes thousands of exclusive clips and images you won't find anywhere else. Choose from an exciting collection of Web Art images and dazzling animations for the web, a spectacular array of photos and photo objects that will enhance any and every brochure, document or presentation you wish to create. Finding that perfect image is easy when you use the MasterClips browser to search and view thumbnails of the entire collection. A simple key word will target in on the category of clip you are seeking. Included in MasterClips 1,000,001 is a free subscription to the Web Site 'Art Today' where you can download images directly to your desktop.

Features:

- 1. The Powerful Browser** - Stop shuffling CD's! Search and view thumbnail images of the entire CD collection of over 500,000 images from two navigation CDs. You supply the keywords, the browser pin-points the perfect image fast. With other collections, if it at all exists, the right image is just a needle in haystack! Or access over 500,000 other images online.
- 2. The Colour Catalogue** - Over 1,000 pages of colour pictures are intelligently arranged for speedy reference. When you see what you like, the sampler makes accessing the perfect image a snap.
- 3. Custom Clip-Art** - Easily modify your favourite images with the MasterClips Clip Art Editor. Add text, re-size, even change the colours of any vector art with this powerful application.
- 4. Maximum Image Quality** - Tired of resized and printed images that lose their appeal? Vector art is versatile, skewed, edited and printed! Your documents never looked better.
- 5. 165,000 Vector Images** - Get the highest quality, editable WMF-clip art covering the widest range of subjects imaginable. No other collection spends the time and money updating it's art to guarantee you'll find the diverse, real-world images you demand.
- 6. 32,800 Fine Art Images** - Add style to any publication with unique classic illustration and fine art of exceptional quality.
- 7. 69,500 Classic Images** - Take advantage of an unbelievable selection of classic art, including images from the world-famous Dove collection.



MasterClips Comparison Chart

Content	MasterClips 500,000	MasterClips 300,000	MasterClips 200,000	MasterClips 75,000
Vector Images	165,000	125,000	87,700	54,000
Dover	69,500	47,000	47,000	0
MasterPhotos	61,500	55,000	50,300	19,000
Web Art	213,000	54,800	18,100	0
MasterPhotos Objects	2,050	400	400	0
MasterFonts	Yes	2,000	2,000	2,000
Sounds	Yes	4,600	500	500
Video & Animations	Yes	180	20	20
Browser	Yes	Yes	Yes	Yes
Editor	Yes	Yes	Yes	Yes
3D Art	Yes	Yes	Yes	Yes
	IMS106 ...\$139	IMS105 ...\$119	IMS104 ...\$89	IMS102 ...\$69

only
\$189
IMSI

IMSI

MasterClips Publisher V3

Create it at Home!

Publishing from home or your office? It's both easy and fun with MasterClips Publisher. Wizards and templates walk you from layout to finish. Or you can create your project entirely from scratch. Either way, you have access to the MasterClips award winning collection, as well as the powerful tools of desktop publishing. So, whether for print or the Web, MasterClips Publisher is all you need to make any document attractive and effective.



- Mail Merge
- Microsoft® Office Compatible
- Complete Set of Drawing & Layout Tools
- Photo, Art & Text Editing

Key Features:

- MasterClips 75,000
- Avery Label Templates
- 2,000+ fonts
- Professionally designed templates
- 3D Power Text
- Frame, Text, & Picture Rotation
- Web Publishing

MasterClips WebArt 100,000

Premium Images For Stunning Web Sites.

MasterClips Web Art provides you with the highest quality Web-ready images available so you can easily create professional looking Web pages. Whether you are a beginning Web designer or a pro, MasterClips Web Art gives you the professional results you need fast. Choose from thousands of clip art and photo images for specific uses or create a consistent look throughout your entire Web sites with exclusive Matching Sets. MasterClips Web Art's easy to use browser lets you view images how they would appear on the Web.



IMSI

IMS134 MasterClips Web Art

IMS145 MasterClips Publisher V3

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INTERNATIONAL SOFTWARE WAREHOUSE Pty. Ltd.

Graphics

FIND IT CHEAPER? CALL US - WE WON'T BE BEATEN!*



COREL®

CorelDRAW 8 Productivity, Power and Precision!

**Get a \$199
Wacom Pen
Partner -
FREE!**

Exceed the boundaries of traditional design with CorelDRAW 8. Created for the professional illustrator, graphic artist and desktop publisher CorelDRAW 8 leaps ahead offering sophisticated features and tools required by professionals. CorelDRAW 8 is a comprehensive 32-bit graphics suite designed for Windows 95 and Windows NT 4.0. Building on the strength of its award-winning predecessors, CorelDRAW 8 is feature rich and streamlined for optimum performance. This suite includes tools for illustration, page layout, painting, photo editing, and 3D modeling and rendering. Several utilities are included to provide support for scanning, tracing, OCR, font management, screen capture, OLE scripting and more. Completing the suite are over 40,000 clipart images, over 1,000 TrueType and Type 1 fonts, plus hundreds of photos, Web backgrounds, animated GIFs, templates and more.

CorelDRAW 8 includes:

- CorelDRAW 8
- Corel PHOTO-PAINT 8
- CorelDREAM 3D 8
- Corel OCR-TRACE 8
- Corel TEXTURE
- CorelSCAN
- Corel CAPTURE 8
- Corel SCRIPT Editor and Corel SCRIPT Dialog Editor
- Bitstream Font Navigator 3.0
- Corel Versions

New Features include:

- Streamlined Controls
- Intuitive Behaviour
- Enhanced Tools
- Fill/Outline and Color
- Improved Connectivity
- Powerful Internet Capabilities
- Enhanced Color Support

- Improved object placement
- Customizable Zoom
- IntelliMouse support
- Additional keyboard support with new hot-key combinations

Plus buy CorelDRAW 8 full version or upgrade now and receive a \$199 WACOM pen partner absolutely free!*

The WACOM pen partner is an electronic pen you write with on a pen partner to translate movement to your PC screen rather than using a mouse. It's as easy to use as a pencil, crayon, paint brush or piece of chalk!



COR268 CorelDRAW 8 U/G

\$469

COR267 CorelDRAW 8

\$859

*While stocks last.

Corel Gallery Magic 1,000,000

One Million is an easy-to-use, collection of clipart images, photos, fonts, sounds, and web images at a great price.

Add excitement to any project with Corel GALLERY Magic 1,000,000. Find images with the new browser/search engine and alter them with powerful photo-editing tools. With over one million images* to choose from, this collection is ideal for Web pages, newsletters, flyers and more!



Includes:

- 800,000 Web images*
- 140,000 vector clipart images*
- 60,000 photos
- 1,000+ fonts
- 530+ sounds
- 125 videos
- Plus... Corel Photo House 2.1 Touch up, alter or enhance your Corel GALLERY™ 1,000,000 digital images

* Note: Includes over 825,000 images new to this product plus over 175,000 images from Corel GALLERY Magic 200,000.
† Web browser required.

COR541 Corel Gallery Magic

1,000,000

\$169

CorelDRAW Select Edition



Ideal for both simple and complex projects, this exceptional graphics suite gives you the tools you need for breathtaking results. Take advantage of CorelDRAW 7 and Corel PHOTO-PAINT 7 for graphic design, photo editing, special effects, illustration and page layout. A property bar that changes to suit the task at hand and a customizable user interface let you edit icons, arrange toolbars and toolboxes-and more. CorelTUTOR and context-sensitive Hints give you help when you need it. Plus, interactive tools and utilities provide onscreen feedback, making the design process much more intuitive.

COR542 CorelDRAW Select Edition

\$149

Corel Print House Magic Deluxe



An easy-to-use graphics package with everything you need to create hundreds of home and business projects. Create sensational greeting cards, online postcards, calendars, banners, flyers, signs and more. Touch up or alter your favourite photographs and digital images using Corel Photo House 2. Keep track of addresses and special events using Corel Family & Friends. With over 100,000 graphics, access to animated online greetings, and free samples of specialty paper from Hewlett-Packard included in the box, Corel Print House Magic Deluxe unleashes your creative power!

COR525 Corel PrintHouse Magic Deluxe

\$99

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PINNACLE STUDIO DCIO PLUS



\$679

The Studio DCIO Plus is an easy to use PC video editing system. Using Microsoft DirectShow software, the Studio DCIO Plus lets you preview your edits without rendering. So, when you make changes to your movie, you can view the changes instantly in a Preview Window. And when you are ready to finish your movie, Studio DCIO Plus saves you even more time and drive space by only rendering the scenes that you have altered. And as the Studio DCIO Plus overcomes the 2GB Video for Windows file size limitation, you can make longer movies than you can with other desktop video editing solutions. Studio DCIO Plus gives both Composite and S-video inputs and outputs, allowing you to capture and output your video with VHS, S-VHS, 8mm and Hi-8 units. You can then output to CD-ROM, videotape, the Internet or even into Powerpoint presentations.

PIN024 Studio DCIO Plus

\$679

Bradley



23

CAD

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We have a new website address:

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If you have visited our website before, we invite you to take another look. You will find it has changed quite dramatically. More information, more products and more importantly, more great deals! Thousands of products, all at the best prices. Whether you are looking for information, or want to place an order, make sure you pay us a visit first!

AutoCAD LT 98

The award-winning AutoCAD just got better!



New AutoCAD LT 98 was designed to make your job a little easier! AutoCAD LT 98 is the only affordable, easy-to-use 2D drafting solution that offers superior performance, speed, reliability and seamless integration with AutoCAD software. A proven favourite in the affordable 2D CAD category, AutoCAD LT software has been ranked #1 in new and total unit sales for the last three years in a row and boasts more than 800,000 users worldwide.

- A visual, intuitive interface makes AutoCAD LT 98 easy to learn, use and remember,
- Quick, precision drawing tools ensure professional drawing productivity,
- Innovative online help and self-paced multimedia tutorials ensure fast product learnability,
- Because it's part of the Autodesk family of products, AutoCAD LT 98 is the only low-cost, 2-D drafting program that's 100 percent compatible with all the innovations in AutoCAD.

QUI051 AutoCAD LT 98 **\$699**
QUI053 AutoCAD LT 98 U/G **\$365**

Visio Standard 5.0

The smartest way to create all your business diagrams

With Visio you can easily create any kind of business diagram - everything from timelines to network diagrams to office layouts.

Diagrams for all business users

Visio Standard is designed to help increase the productivity of mainstream business users by allowing them to easily communicate and track work projects and flow, reporting structures, and concepts or systems. Visio

Standard allows business users to visualise information commonly stored and distributed in databases and spreadsheets, thus avoiding complex and time-consuming analysis of data and figures. In addition, dynamic links between business diagrams and the databases and spreadsheets that hold the raw data are easily integrated - so an organisation chart can automatically reflect changes in an employee database, or a flowchart can report the costs associated with a new process.

Microsoft compatible

Visio is Microsoft compatible enabling you to easily build and share your business diagrams. Best of all you can simply drag and drop your diagrams into any OLE compliant word processor, presentation package, spreadsheet or other software.

Supports Internet/Intranet Standards

Visio Standard also helps you get your visual information out to the people you need to via its built-in support for Internet/Intranet standards (HTML and ActiveX) and document management standards ODMA.



VIS099 Visio 5.0 Standard **\$249**
VIS100 Visio 5.0 Upgrade **\$159**
VIS101 Visio 5.0 10 user license pack **\$1999**

All prices INCLUDE sales tax. Prices subject to change, see page 48 for terms & conditions.

AutoSketch 6.0

Spend Time Drawing - Not Learning Software!

An affordable and easy-to-use precision drawing tool for new or occasional CAD users who need to create conceptual drawings and sketches. AutoSketch 6.0 provides productivity and ease of use features not found in other low cost precision drawing programs such as:

- Drawing Guides
- Automatic Snap
- Spell Check
- Dynamic Pan & Zoom
- AutoArray
- Detail View
- Construction Lines
- Advanced tools for easier wall placement
- Hyperlinks



Other features include 3-D Effects to add more impact to conceptual drawings, proposals and presentations; customisable grids; in-place OLE editing and the ability to import/export DWG files. Compatible with Microsoft Windows 98, 95 and NT.

QUI052 AutoSketch 6.0 **\$169**

Visio Technical 5.0

Create & share technical drawings

Simply choose from the included library of more than 4,000 expert-designed, industry-specific symbols, then drag and drop the shapes you need onto the drawing page to assemble technical diagrams in record time.

1. Fast - its drag-and-drop drawing style and intuitive work environment enables users to quickly produce high-quality technical diagrams with little or no training.
2. Intelligent - Every SmartShapes symbol can store a unique set of data and is programmed to behave like its real-world counterpart.
3. Compatible - With built-in CAD integration you can read and write files in popular CAD formats, and even convert static CAD symbols into dynamic Visio Technical shapes.



VIS102 Visio Technical Upgrade **\$339**
VIS103 Visio Technical 10 user license pack **\$4659**

Visio Professional 5.0

For the IT experts!

Visio Professional 5.0 makes it easy to visualize and communicate the IT infrastructure of your business across the cross-functional boundaries in your organisation, sharing and leveraging data with your coworkers. Job-specific shapes and tools help you maximize efficiency.

- Network diagramming and documentation.
- Software diagramming and documentation.
- Database diagramming and documentation.
- Share and exchange information.
- Create custom shapes.
- Integrate Visio Professional into a custom solution.
- Add ActiveX controls.
- Tap our developer resources.



VIS104 Visio Professional Upgrade **\$339**
VIS105 Visio Professional 10 user license **\$4659**



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Between February 1st, 1999 & March 31st, 1999 IMSI will be helping you get Year 2000 ready. We will be including a free CD copy (OEM version) of our survive the millennium bug product, Year 2000 Now, with all our products.

FloorPlan 3D Design Suite

Bring your home, office, & garden ideas to life.

FloorPlan 3D Design Suite has what any building or landscaping project needs. Easy-to-use tools give you the power to transform design ideas into stunning photo-realistic 3D images.

Whether you're creating a home, remodelling an office, adding a deck or landscaping a ten-acre spread, the FloorPlan 3D Design Suite has everything you need. Perfect for custom homes, detailed offices, multi-story layouts, remodelling jobs, easier landscaping, bathrooms, kitchens, and project planning.

DRAW WITH SPEED AND PRECISION.

Get started quickly with an existing layout, or start from scratch using FloorPlan 3D's easy-to-use drawing tools. The multimedia quick tour shows you how. Designing custom walls, stairs and roofs has never been easier.

VIEW YOUR PROGRESS IN 3D.

Create custom views. Navigate your designs with easy-to-use, walk-through commands. FloorPlan 3D's flexible tools even let you edit objects and make colour or texture change anytime.

RENDER LIFELIKE PREVIEWS.

See your virtual home from any angle with realistic shadows and reflections using Lightscape technology. FloorPlan 3D's unbeatable previews render the "photo-realistic" images of other products obsolete.

REALISTIC TEXTURES.

If you can't decide between granite or marble, redwood or brick, FloorPlan 3D shows you the way with texture alternatives from floor to ceiling!

AWARD-WINNING PLANS

Kick your project off by browsing the Interactive Multimedia Home Designs Encyclopedia from HomeStyles. Whether you are looking for a two-story Tudor or an expansive ranch house, the sheer range of top quality designs are sure to inspire. We've even included 150 editable plans to get you started!

"FloorPlan highlights just how incredibly powerful and affordable professional-level CAD programs have become" PC Review, February 1998.

Key Features:

- Lightscape Technology
- FloorPlan 3D
- 3D Garden Designer
- HomeStyles Home Design Encyclopedia
- TurboProject Express
- Home & Office Symbols
- Unlimited database expandability
- Same document floor levels
- Interactive multi-run stairs
- Automatic creation of opening for stairs



IMSI

Stock Code:IMS132

\$99

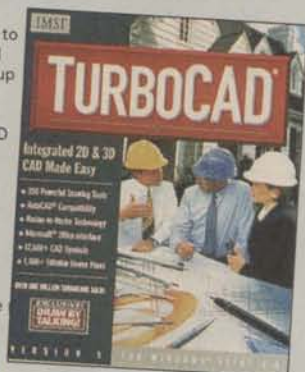
TurboCAD V5

Announcing the new version of the award-winning TurboCAD!

TurboCAD V5 makes computer-aided design power and precision available to anyone. You will find lots of new and exciting features including handy setup wizards, tool tips and a Microsoft Office interface that will speed you through the design process. TurboCAD V5 delivers integrated 3D wireframe capabilities and voice enabled commands allowing you to draw by talking. Also includes raster to vector technology allowing you to convert scanned images into editable TurboCAD drawings, full AutoCAD compatibility, 12,000 CAD symbols and clip art, plus 1,000 editable house

Features:

- Handy setup wizards
- 3D wireframe capabilities
- Voice-enabled commands
- Raster to vector technology
- Full AutoCAD compatibility
- 12,000 CAD symbols
- 1,000 editable house plans



IMSI

\$169

IMS118 TurboCAD V5

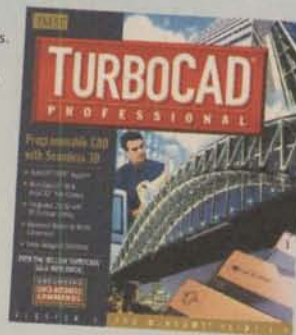
TurboCAD V5 Professional

Full Featured 2D CAD with integrated 3D

Add real productivity to the time you spend designing as you draw with precision, render and edit in 3D, and share files with ease. TurboCAD Professional is the complete CAD solution that is familiar, compatible and fully programmable. TurboCAD Professional allows you to create drawings using state-of-the-art speech recognition technology. This powerful software recognises 300 CAD commands. TurboCAD Professional v5 is the only voice enhanced CAD application on the market. The most demanding design environments deserve powerful, accessible tools - the kind you will find right here in TurboCAD Professional!

Key Features:

- Full Featured 2D CAD
- Seamless 3D Integration
- Compatible With Your Design Environment
- Voice Recognition TurboCAD Programmability
- Tips and Tricks



\$449

IMS119 TurboCAD V5 Professional

All prices INCLUDE sales tax. Prices subject to change, see page 48 for terms & conditions.

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Simplecomputing NetExpress 56 - SVD Data Fax Voice Modem



Simple NetExpress 56K V90 BANO41 **\$189**

Using the Simplecomputing NetExpress 56 to connect to the Internet will open up endless communication and exploring opportunities. High speed Access 56K V.90 modems are the fastest on the market. The NetExpress 56 is powered by Rockwell technology and supports both K56Flex and V.90 modem standards. The NetExpress 56 is flash upgradable to future 56K V.90 enhancements that can be quickly downloaded, keeping your modem forever fast. The NetExpress 56 comes with a free CD-ROM that offers you everything you need to get onto the internet, including a web browser, offers from Australia's leading ISP's and email software.

Not just a super-fast surfing machine, the NetExpress 56 offers all the latest modem features:

- Fax
- Voice
- Speakerphone
- Simultaneous Voice and Data

Maria



25

EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!



KENS KORNER

Hi, I'm Ken, Technical Manager at International Software Warehouse. As part of our new commitment to value, each month I will be bringing you special offers that can't be missed. Some of the products will be previous versions, others may have damaged packaging. ALL will have unbeatable pricing. ALL will carry normal guarantees and warranties. Here are a couple of examples:

Netcomm Roadster II Ultra.....\$150
Epson Stylus 600.....\$240
Iomega Zip External.....\$175
Adobe Photoshop 5.....\$750
Drive Image.....\$55
Windows NT 4 Workstation.....\$250

These bargains are snapped up quickly, so always call to confirm. For the very latest update, check out my section on our website at www.iswh.com.au. You can even order direct from our site! International Software Warehouse - bringing you the best deals every month.

Ken



WinFax PRO 9.0

The world's #1 choice for hassle-free faxing!

WinFax PRO 9.0 software takes Symantec's industry-leading fax solution to new levels of flexibility, reliability, and ease of use.

With WinFax PRO 9.0

- Small businesses can look more professional by sending crisp laser-quality faxes.
- Workgroups can save money by sharing a fax modem and phone line through a non-designated fax host.
- It can also notify mobile users via pager or PCS cell phone as soon as an important fax arrives, or automatically forward faxes to another fax number or an e-mail address.



SYM191 WinFax PRO 9.0

\$129

TalkWorks PRO 2.0

Give your small business a professional voice

TalkWorks PRO 2.0 from Symantec brings professional voice and fax messaging to home offices and very small businesses. Its integrated capabilities keep you in touch with your customers 24 hours a day. Offer fax-on-demand to provide your customers with information at any time, and use the completely integrated faxing capabilities of WinFax PRO 9.0, the leading fax software from Symantec.

With TalkWorks Pro 2.0

- Set up separate mailboxes for employees, fax on demand, and other purposes.
- Get remote notification when a voice or fax message arrives
- Track faxes and voice calls
- TalkWorks PRO 2.0 even supports Caller ID*



*Caller ID service from telephone service provider and caller ID-capable modem required for some features.

SYM193 TalkWorks PRO 2.0

\$219

ACT!™ 4.0 SYMANTEC. Get ACT! Get Results!

Nobody knows your customers better than you do. The trick is remembering the right things about them at precisely the right time. ACT!™ 4.0 puts the information you need within easy reach - phone numbers addresses, order history, even invoice dates.

• Leverage the Internet

ACT!™ 4.0 teams up with your Web browser to search services like WhoWhere, Yahoo, and Bigfoot. Find new customers and prospects - names, company names, and email addresses, then download them directly into your database.

• Stay connected online

If you want to see a client's Web site, you can store the URL and launch it right from within ACT!™ 4.0. Plus, you can contact people online with complete support for Internet email.

• Become a genius with details

Use new SideACT! To write names, numbers, appointments, and other important messages to yourself - all without launching ACT!™ 4.0. Later, you can transfer what you need over to ACT!™ 4.0 and still be completely organised.

• Manage every day more efficiently

ACT!™ 4.0 simplifies your life by putting all your daily essentials within easy reach - daily, weekly, and monthly calendars, a handy to-do list, even on-screen alarms.

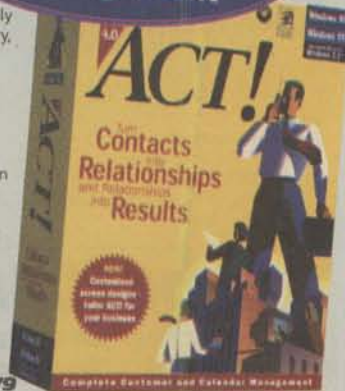
Features:

- Now includes business templates for major business across Australia
- Flexible customer database - Get started right away with 70 preset user fields
- Customise the database with your own fields, custom screens and on-line forms
- Work in form or list view
- Attach files, such as spreadsheets and documents, to your contacts

STOCK CODE: SYM179

\$149

Complete customer & calendar management



pcAnywhere™ 8.0

Easy remote access to PCs from anywhere, anytime!

pcAnywhere 32 for Windows 95 and Windows NT is the fastest, easiest way to remotely access PCs, applications, and information from a home or office PC or network. Make quick, easy connections via modem, network, or the Internet to check e-mail, remotely support clients, download files, or simply run remote applications. Expanded Internet support, with SmartList and advanced security options, allows you to easily and safely access your PC while saving on long-distance phone charges.

Features

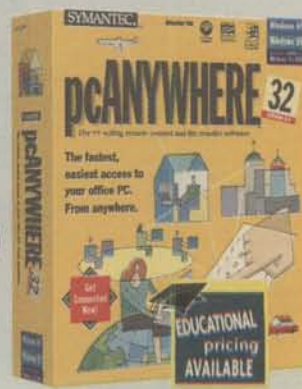
- Enhanced performance - 20% faster than previous versions, to increase productivity and minimise connection costs.
- AutoXfer - Automatic file transfer and synchronisation quickly and easily provides you with the most current version of remote files
- ColorScale - Improves screen refresh rates so you can work faster
- SpeedSend - Transfer only the parts of the files that have changed. Fast.
- Optimised desktop - Unique speed options disable host wallpaper, screen savers and full window dragging, for faster remote control.

Saves you money on long-distance calls!

SYM170 pcAnywhere V8.0

\$199

SYMANTEC.



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DON'T FORGET TO ASK FOR YOUR FREE GIFT

The only thing better than having so much information at your fingertips... is discovering the best ways to make use of it!

CD Phone Directory

Virtually every Australian Business & Residential Phone Directory at your fingertips!

Don't miss this amazing offer! This special edition of CD Phone Directory comes with a Bonus \$10 worth of free long distance phone calls... so you're getting CD Phone Directory for half price! Imagine how much easier and faster it would be if you had virtually every Australian business & residential telephone number on your own PC! Only DtMS CD Phone Directory puts Australia at your fingertips!



- ✓ Hurry, this limited edition includes a bonus \$10 worth of long distance phone calls!
- ✓ Gives instant access to over 8,000,000 business and residential listings across Australia!
- ✓ Search by Company Name, Line of Business, Surname & Initial, Suburb, State or Postcode!
- ✓ Provides you with the tools to find friends, relatives or all those people you've wondered about... easily and quickly!

FREE \$10 worth of long distance phone calls

DTM011 CD PHONE DIRECTORY **\$19**

Wasting too much time on the road? Get LapLink Professional, and get productive.

LapLink Pro lets you work whenever and wherever it's convenient for you. When you need to share information between an office PC, a laptop, or your home PC while travelling or working away from the office, LapLink Pro will get you connected.

LapLink Pro sets the standard in usability and is the #1 rated choice for easy, speedy and reliable remote control and file transfer by mobile professionals and telecommuters.

When you take a look at the features this product offers, it's no wonder that LapLink Pro is agreed upon by the experts to be the "best remote control access solution today":

- Print redirection from remote PC to local printer, or to a remote PC's printer
- Optimised for Windows 98
- Supports USB cable for faster file transfer
- Includes bonus Windows CE remote control software
- Single mode operation - no need to set "guest" or "host" modes
- Adaptive compression automatically gives optimal speed over all connections
- Integrated scheduler for Windows 98, 95, NT
- Smart Install configures all devices automatically - no user intervention required
- Compatible with Windows 3.1, 95, 98, and NT



LapLink has won more awards than all of its competitors put together.



LAP011 LapLink Professional **\$179**

LAP009 LapLink Technical **\$279**

Phonedisc

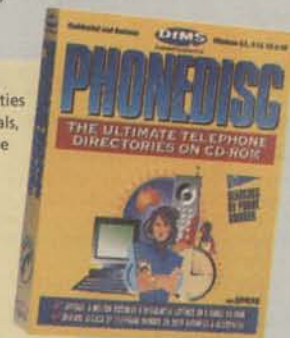
With Search by Phone Number!

A powerful tool for finding what you want and who you want in seconds! Imagine the advantages of a telephone directory that not only gives you much more information, but gives it to you the way you want it! For businesses or home

use, Phone Disc provides a powerful tool for locating new clients, suppliers, friends, relatives or virtually anyone, anywhere with just a few easy keystrokes.

Features:

- ✓ Powerful reverse search capabilities
- ✓ Search by Name, Company, Initials, Surname, Suburb, state, Postcode or line of Business.
- ✓ Full Boolean search capability
- ✓ "Sounds-like" facility
- ✓ Auto dialer facility
- ✓ Contact sensitive on-line help
- ✓ Copy entries to the Window Clipboard
- ✓ And much, much more!

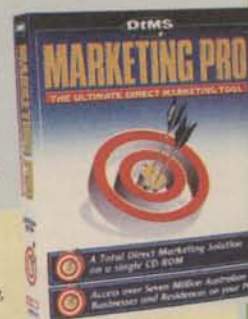


DTM001 Phonedisc **\$89**

Marketing Pro The Comprehensive Direct Marketing Tool!

Put cost efficient and effective marketing at your fingertips! Make the most of your marketing dollar! Marketing Pro puts the ultimate Direct Marketing Tools in your hands. After all, no-one knows your product or your service better than you, so why not make the most of your market potential? Put Marketing Pro to work for you and you'll discover the most cost effective way to increase business!

- ✓ Access over 8,000,000 prospective clients!
- ✓ Search for, locate and compile prospective leads and clients easily and quickly.
- ✓ Search and compile data by business type, city, address, phone number, postcode, Ad size, address, industry codes, state, regions, employee size, mobile-phone number and much more!
- ✓ Utilize powerful software functions that provide you with the tools to organise, select and compile data the way you need it.
- ✓ Take advantage of the most up-to-date and powerful data retrieval engine.
- ✓ Query by example searching.
- ✓ Easy label and report printing.
- ✓ Easily eliminate duplications.
- ✓ Utilize Marketing Pro for the ultimate telemarketing facilities.
- ✓ Auto-dial and much, much more!
- ✓ Updates available quarterly.



DTM003 Marketing Pro Melbourne **\$495**
 DTM004 Marketing Pro Sydney **\$595**
 DTM005 Marketing Pro Brisbane **\$595**
 DTM006 Marketing Pro Vic/Tas **\$595**
 DTM007 Marketing Pro NSW/ACT **\$595**
 DTM008 Marketing Pro QLD/NT **\$595**
 DTM009 Marketing Pro SA/WA/NT **\$595**
 DTM010 Marketing Pro National **\$1095**

Fax Pro

Instant Sales For Your Business!



Fax Pro DTM002 **\$275**

Forget about hit and miss mail-outs - dial direct and reach your target market instantly!

Why waste time and money on expensive mail-outs when you can go directly to your target audience at the touch of a button? Put the power of direct marketing at your fingertips with FAX PRO!

- Access over 300,000 Australian & New Zealand business fax listings!
- Sophisticated searching techniques make fax-broadcasting a breeze.
- Locate, organise, file or print your search criteria easily, quickly and in the format that's most appropriate for your application.
- Compile, Tag, File, Print and fax-queue virtually any-way you want.
- Combine and sort sets easily and quickly!
- Isolate and locate the businesses that need your service or product and contact them quickly and cost effectively.

Ali



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SOMETHING FOR EVERY PC.....Category
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**McAfee Office**
One solution for every PC problem!

Office is the latest addition to the McAfee family of products. Designed to keep your PC running at optimum performance McAfee Office offers the PC user everything they could possibly need to maintain a healthy system. With full versions of VirusScan 4, First Aid 98, Nuts & Bolts 98, Guard Dog, Uninstaller, Year 2000 Toolbox, Oil Change, and Hurricane - McAfee Office offers over \$600.00 worth of value for only \$169.00.

Stock Code: MCA075

\$169**Uninstaller Deluxe**
Create More Disk Space
...Automatically!

No matter how much hard disk space you have, it never seems to be enough. You have old programs, files downloaded from the Internet, files left behind from programs - all adding up to clutter up your PC. With Uninstaller, you can get rid of the junk files and programs on your PC, safely and thoroughly. The result is a cleaner, smoother-running hard drive!

Stock Code: UNI009

\$85**System Commander**

As easy as changing channels on your TV, you can now switch between operating systems on your PC. System Commander lets you run up to 100 different operating systems all on the same PC - without giving up your current operating system - without using any resident memory - with just a click of a button! Plus, System Commander's multi-user security system protects access to your computer!

Stock Code: VCO001

\$119**Dr Solomons Anti-Virus**

Dr Solomon's Anti-Virus is the only anti-virus product available in Australia that is able to automatically detect and eliminate over 17,000+ known viruses that are out there, ready to attack your PC. With over 3 million users worldwide. 24 hour, 7 day technical support and on-line upgrades for killing new viruses it's no wonder Dr Solomon's is trusted by over 3 million people worldwide. It's the world's most advanced, trusted and widely used anti-virus program.

*Computer viruses are increasing at the rate of 300+ per month.

Stock Code: NIT005

\$79**Virus Scan Version 4.0**

Detect and Destroy ALL viruses. McAfee Macro Hunter technology safeguards your PC from all virus types and from all potential sources. Virus Scan stops destructive Active X and Java applets often downloaded from the Internet. It scans all your e-mail attachments right inside your mailbox, so viruses never reach your system. SecureCast prepares you by using Internet "Push" technology to deliver virus updates directly to your desktop, automatically for the life of the product.

Stock Code: MCA070

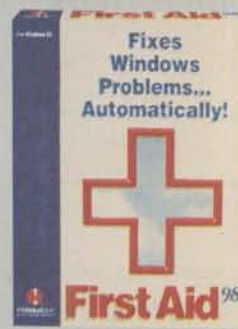
\$69**First Aid 98**

Fixes more Windows problems more automatically than any other software

What First Aid will do for you!

- Warn you in advance of hard drive failure
- Correct tens of thousands of known problems and help keep your PC conflict free
- Take the risk and hassle out of adding new programs and multi-media cards
- Search the Internet to find the latest solutions
- Act as your, personal 24 hour technical support expert

Stock Code: RMG211

\$65**Nuts&Bolts98**

Nuts&Bolts98 - It's everything you need to clean, optimize, monitor and analyse your PC system and software.

- Efficiently manage and secure your data, and swiftly recover from a disaster.
- Prevent crashes and correct system problems - automatically - before they occur.
- Customise Windows98 to really work for you.
- NEW enhancements boost your PC's performance from launch acceleration to disk defragmentation.
- NEW Year 2000 technologies prepare you for the next millennium.

Stock Code: MCA054

\$89**HotFax MessageCentre****HotFax MessageCentre**

Transform your PC and voice mail compatible modem into a sophisticated communications centre. Whether you're at home, in the office, or on the road, you can customize cover pages and send faxes with ease, add high-tech telephone capabilities to your computer, and remotely access your PC for the retrieval of faxes, files and voice mail. You can link your pager to your PC to ensure you're always in touch, send voice e-mail over the Internet, and much, much more.

Stock Code: SMS002

\$79

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INTERNATIONAL SOFTWARE WAREHOUSE Pty. Ltd.

Utilities

FIND IT CHEAPER? CALL US - WE WON'T BE BEATEN!*

Norton SystemWorks™ 1.1

Norton SystemWorks™ offers five award-winning, integrated utility products, plus a Bonus Pack.

Norton SystemWorks™ is the first fully integrated, comprehensive utility suite, comprised of five award-winning Symantec products, plus a Bonus Pack. These state-of-the-art products work together to both fix and prevent system problems.

- Norton AntiVirus™ 5.0 – offers the world's most popular and most powerful anti-virus capabilities – including the ability to isolate infected files before they can damage your system.
- Norton Utilities™ 3.0 – is the industry leader in detecting, repairing, and preventing hardware and software problems. It also optimises your computer to run at peak efficiency.
- Norton CleanSweep™ 4.5 – recovers disk space by safely and completely removing unnecessary programs and files.
- Norton CrashGuard™ 4.0 – automatically protects against system crashes and screen freezes. It not only minimises the chances of a crash, but in most cases lets you save your work if a crash occurs.
- Norton Web Services™ – is an online service that keeps your system running smoothly by giving you easy access to the latest virus definitions, hardware drivers, and software updates.

The Bonus Pack includes:

- Norton 2000™ – to make your PC and data "millennium ready".
- Norton Mobile Essentials™ – resolves laptop connection problems.
- WinFax™ Basic Edition sends and receives faxes directly from your computer.
- Symantec Visual Page™ – a web development tool.

SYMANTEC.



\$169



Norton AntiVirus™ 5.0 Gold Edition

Norton AntiVirus™ from Symantec is the #1 anti-virus software in the world.

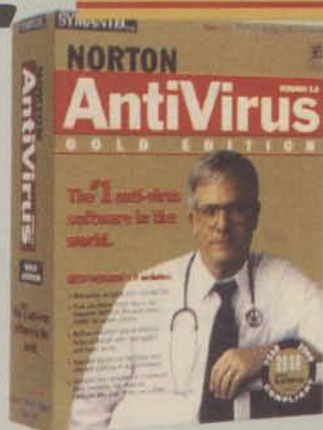
New features in version 5.0 let you quarantine infected files, easily get help with viruses directly from Symantec researchers, and it automatically protects you against viruses as well as malicious ActiveX and Java applets.

- Quarantine an infected file, and it's safe to store on your computer without fear of spreading the virus. The new Scan and Deliver wizard makes it easy to send quarantined and other suspicious files to Symantec for evaluation. The virus experts at the Symantec AntiVirus Research Center (SARC) will reply swiftly with helpful advice and any needed anti-virus definitions.
- With version 5.0, the software can also detect dangerous forms of ActiveX code, Java applets, and Trojan horses, giving you the industry's most complete protection against malicious code.
- Bloodhound technology uses advanced heuristic logic to "sniff out" and eliminate new viruses even without updated virus definitions.

As always, Norton AntiVirus can run constantly in the background to keep your computer safe from viruses that might come in from e-mail attachments, Internet downloads, floppy diskettes, software CDs, or a network. And it can be scheduled to automatically retrieve new anti-virus definitions from Symantec as often as once a week.

\$85

YEAR 2000 COMPLIANT



SYMANTEC.

Norton 2000

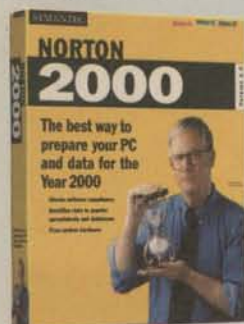
Prevent damage to your company's desktop PCs and data from Year 2000 problems.

In assessing Year 2000 exposure, don't forget that date anomalies in desktop PCs or applications can cause local problems or spread to the mainframe.

Norton 2000 gives you an easy, reliable, and powerful way to address Year 2000 anomalies at the desktop level, in applications, and in system clocks and BIOS.

Features:

- Finds Y2K anomalies in desktop applications.
- Tests and fixes system BIOS and clocks.
- Automatically updates database of Y2K compliant software.
- Supports central installation and administration.
- Provides flexible scanning/reporting options.



NOR086 Norton 2000

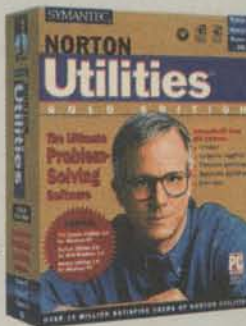
\$69

Norton Utilities

Gold Edition
Unrivalled problem solving power.
Unrivalled Control

Proving again there's no substitute for experience, now Norton introduces the most powerful set of utilities ever created.

- The #1 problem-solving software for over fifteen years
- The industry leader in detecting, repairing and preventing major and minor computer problems
- Optimises your computer to run at peak efficiency
- Detects Windows problems in the background and provides intelligent repair
- Prevent crashes and screen freezes three times as effectively as any competing product
- Detects viruses and repairs infected files
- Lets you customise operations, or set Norton Utilities to work continuously
- Downloads the latest application patches and drivers over the Internet.



NOR077 Norton Utilities Gold Edition

\$99

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PROGRAM
SAVE TIME AND
MONEY**

**SYMANTEC.
VALUE LICENCE
PROGRAM**

The Symantec Value Licence Program has been designed to make purchasing Symantec products quicker and cheaper. Just one phone call to our sales team could get you significant discounts for your organisation. Reordering is then a simple case of calling us and quoting the number from your certificate. Designed for companies and organisations ordering more than 10 licenses, the Symantec Value License Program ensures you get the discounts you deserve.

**YES! WE SELL
NORTON GHOST
Call for details**

Joanne

29

EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!

Fandango

Fandango
COM103\$45

Fandango is the fast, fun way to create screensavers of all kinds for Windows 95. All the complex work is already done for you, just load some images, choose a style and adjust the simple, easy to understand controls and go! It's quick and easy to learn and requires absolutely no programming. Once you have finished your masterpiece you can install it on your own system or save it as a standalone project for other to use.

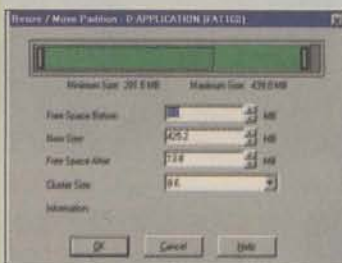
You can make screensavers for your own pleasure, for the company network or for distribution for promotion or profit - there are no royalties to pay.

PartitionMagic 4.0**Reclaim up to 40% of your hard disk & organise your hard drive!****Reclaim Wasted Disk Space**

Everyone wants to get the most they can out of their hard disk. But, up to 40 percent of your hard disk may be totally wasted due to inefficient storage methods. PartitionMagic 4.0 increases your usable disk space by shrinking large FAT partitions and restructuring cluster sizes to reclaim up to hundreds of megabytes of lost disk space.

Safely Run Multiple OS's

PartitionMagic 4.0 makes it easy to run multiple operating systems on the same machine without compatibility problems. Explore the new world of Windows 95, 98 or NT while still relying on the security of your current operating system. And PartitionMagic 4.0 includes BootMagic from IBM, making it easy to select an operating system every time you boot your computer.



Create, resize and delete partitions with the drag of a mouse.

Organise and Protect Data

Create a physically separate partition for your valuable data files to protect them from potentially unstable applications. This simplifies backups, especially to devices like ZIP™ drives. And with the transport feature of Uninstaller™, PartitionMagic 4.0 lets you easily move applications from one partition to another with their files and operating system settings in place.

**WHAT THE PRESS SAY..**

"Unique, dazzling and indispensable, PartitionMagic is a must have product in an era of larger and larger hard disks"
PC Magazine

PartitionMagic
HARD-DISK PARTITIONING ON THE FLY



POW034 PartitionMagic 4.0

\$99

POW033 PartitionMagic 4.0 Upgrade

\$59Now with
BootMagic included!**WristGliders™**
What are WristGliders™?

WristGliders™ are a revolutionary ergonomic wrist support which can minimise or eliminate the effects of R.S.I. The cushioned circular vinyl platforms glide independently with each hand to provide comfort, flexibility, and proper wrist alignment while using the keyboard and mouse.

WristGliders™ are engineered specifically to provide a new level of comfort and convenience for anyone who uses a computer keyboard or mouse. They're large enough to provide excellent support, yet small enough to be completely portable and unobtrusive.

And thanks to an innovative design that allows them to glide freely over your desktop, WristGliders™ deliver the kind of constant, uninterrupted support medical professionals recommend. WristGliders™ are proven to reduce the stress in your back, shoulders, neck, and arms. With WristGliders™, you'll work relaxed and be more productive than ever before.

So whether you currently suffer from R.S.I or not, you owe it to yourself to try WristGliders™, the medically proven solution that's affordable, effective, and comfortable.

How to use WristGliders™

1. Place WristGliders™ felt side down on the work surface at the base of your computer keyboard.
2. Rest the outside of each wrist comfortably on the centre of each WristGlider.
3. Relax your neck, shoulders, arms, and hands.
4. To accommodate normal hand and arm movements, allow WristGliders™ to glide freely over the work surface.

Because most people lift their arms and wrists off typical wrist rests as they keyboard and navigate with a mouse, wrist rests simply cannot offer the kind of constant support medical professionals recommend. WristGliders™ glide freely over your desktop to accommodate natural hand movements and provide comfortable, constant support.

CHK018 WristGliders 3-Pack (2 keyboard, 1 mouse)

CHK019 WristGliders Single Pack

All prices INCLUDE sales tax. Prices subject to change, see page 48 for terms & conditions.

For the cost of a local call **Orderline 1300 300 003 or 02 9700 8800**

Sales Lines Open 9am 'til 6pm Monday to Friday and 10am 'til 3pm Saturday



INTERNATIONAL SOFTWARE WAREHOUSE Pty. Ltd.

Utilities

FIND IT CHEAPER? CALL US - WE WON'T BE BEATEN!*

PKZip 2.6

The Original Compression Program

The growth of the Internet and the increased use of World Wide Web browsers are creating a greater need to compress data files. Saving disk space and saving on-line phone charges are big benefits of compressing data files with PKZIP.

PKZip 2.6 has been determined by PC Magazine Editor's Choice (03/98), as the best compression utility. "All the programs reviewed here will get the job done, but PKZIP delivered the best combinations of features".

PKZIP compresses files on average 50-70% with many large text and database files compressing well over 90%. PKZIP's simple point-and-click interface lets you easily compress one file, or all files on an entire hard drive, and store them in the .ZIP file. PKZIP 2.6 has the added feature of being able to create self-extracting files that span multiple diskettes.

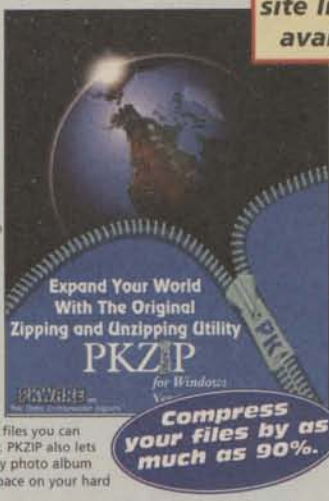
Using PKWARE patented compression technology, PKZIP combines the best and fastest compression found in PKZIP with ease-of-use of a Windows program. PKZIP for Windows is compatible with Windows 95, Windows NT, Windows 3.1 and with ZIP files created on other PKZIP platforms. Other platforms include DOS, OS/2 and OpenVMS for VAX and Alpha.

Use PKZIP Whenever You Are:

At Home - The Internet contains many .ZIP files you can access through a World Wide Web browser. PKZIP also lets you archive files such as the digitized family photo album or annual budget in .ZIP files, saving you space on your hard drive.

On the Road - Use .ZIP files when sending email, storing presentations, or transferring files between your office PC and your laptop.

At the Office - Network and system administrators save space on their servers and reduce traffic over the Intranet or corporate network using .ZIP files.



Corporate site licences available

WinZip 7.0

The ultimate Companion for Internet Downloading

"Probably one of the wisest investments a savvy windows user can make"

WinZip brings you the convenience of Windows to the use of ZIP files without requiring PKZIP and PKUNZIP. It features an intuitive point-and-click drag-and-drop interface for viewing, running, extracting, adding, deleting, and testing files ZIP, LZH, ARJ, and ARC files.

The Zip Advantage:

WinZip safely compresses the data in your files, so that your files occupy less space. This allows you to save more time by speeding up file transfers.

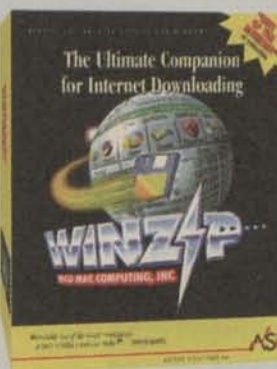
"Zipping" reduces the size of files, while "Unzipping" restores the files to their original form, completely unchanged.

Internet Surfers:

WinZip makes it easy for you to access almost all of the compressed files you download from the Internet. WinZip features built-in support for Zip, TAR, gzip, Unix Compress, UUENCODE, BinHex, and MIME files.

Key Features

- Tight integration with the Windows 95/NT shell
- Drag & Drop to or from the explorer, or ZIP & UNZIP without leaving the Explorer
- Drop files on a printer to print
- With the easy to use tool bar you have the convenience of Windows when Zipping
- Built-in PKZIP-compatible ZIP and UNZIP (PKZIP and PKUNZIP are not required)
- Built-in support for the popular Internet file format TAR, gzip, Unix compress, Uuencode, Xencode, BinHex, and MIME
- Simplify file distribution by making files that unzip themselves
- Optional WinZip Wizard Interface
- Works with ARJ, ARC, and LZH files
- Optional virus scanning support
- Supports Windows 3.1, 95, and NT
- 32 and 16 Bit versions included.



The Archive Utility for Windows

WIN109 PKZip v2.6

\$65

WIN119 WinZip 7.0

\$65

MAUS Stockmarket Plus

MAUS Stockmarket Plus makes monitoring and managing your investments easy!

Analyse different share returns over time, test the likely profitability of different investments, and even learn how to minimise tax.

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KEY BENEFITS

- Professional investment advice in simple English
- Manage stocks, personal finances, property, etc
- Track investments in any ASX listed company
- Download stock prices for fast, accurate analysis

MAU007 MAUS Stockmarket Plus

\$169

MAUS Stockmarket Plus...."is ideal for both novice and experienced investors who require a package to keep track of their stockmarket investments.... Seldom does a software package completely outclass competitors, offering users a clearly superior product in terms of sophistication, simplicity and obvious attention to detail"

Review of core software - Personal Investment Magazine, 1997

MAUS Stockmarket Plus...."is specifically designed for monitoring a share portfolio and has the added advantage of providing analytical tools as well as keeping the records you need"

Review of core software - Editor of Money Section (SMH 17/9/97)

MAUS Debt Collector

The complete debt collection system

MAUS Debt Collector is a complete debt collection system which automatically mail merges reminder and demand letters, reminds you of phone calls and action to take, and prompts you step-by-step through the entire debt collection process. To monitor your success, this revolutionary new product includes a unique graphing and reporting feature to quickly assess your current debtor position.

MAU009 MAUS Debt Collector..... **\$189**

KEY BENEFITS

- Reduce bad debts
- Cut collection time and costs
- Automatically sends 30, 60 and 90 day reminder letters
- Stand alone contact manager stores all debtor details
- Includes professional letters, legal documents & advice



Norton CrashGuard 4.0



Norton CrashGuard 4.0
SYM199 **\$39**

Don't risk losing important documents and hours of work! Norton CrashGuard 4.0 gives you more power to save your work from crashes. It stops crashes from becoming major disasters by helping you save your open documents and get back to work quickly. In fact, you can usually resume your work without rebooting your system. The Crash Assistant feature guides you through each crash situation step by step - even offering multiple recovery options to maximise your chances of successfully saving your work. There's no better software than Norton CrashGuard for recovering from application crashes, application freezes and system crashes.

Mathew



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Y2K

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KENS KORNER

Hi, I'm Ken, Technical Manager at International Software Warehouse. As part of our new commitment to value, each month I will be bringing you special offers that can't be missed. Some of the products will be previous versions, others may have damaged packaging. ALL will have unbeatable pricing. ALL will carry normal guarantees and warranties. Here are a couple of examples:

Netcomm Roadster II Ultra.....\$150
Epson Stylus 600.....\$240
Iomega Zip External.....\$175
Adobe Photoshop 5.....\$750
Drive Image.....\$55
Windows NT 4 Workstation.....\$250

These bargains are snapped up quickly, so always call to confirm. For the very latest update, check out my section on our website at www.iswh.com.au. You can even order direct from our site! International Software Warehouse - bringing you the best deals every month.

Ken

So you know what the millenium bug is. What next?

The Millenium Buster range has been developed to meet the standards as defined by the British Standards Institute Code of Year 2000 Conformity (DISC PD 2000-1). This code has been adopted word for word by Standards Australia and Standards New Zealand (SAA/SNZ MP77:1998), so you can buy with confidence.

TEST



Why pay for a Year 2000 fix if you don't need one? Use the Millenium Buster 1 test program to see if your PC is Year 2000 compliant. The Millenium Buster 1 test program will check ALL of a PC's time keeping components, including:

- Operating System Clock
- BIOS Chip
- Real Time Clock (RTC) Chip

It will test for Year 2000 compliance as well as testing for leap year recognition. At only \$29, can you afford not to test your PC?

So cleverly written it fits on one floppy disk!

Single User
MIL100

\$29

Multi User
Call for pricing

FIX



If you have performed the Millenium Buster 1 test, and have found that you need a software fix, then Millenium Buster 2 is the answer. Again, Millenium Buster 2 works with ALL PC time keeping components. There are very few programs that work with a computers' Real Time Clock. Millenium Buster 2 does, as well as working with leap year recognition. Installing new software? No problem. With the in built Re-Test option, you can check your PC as often as you like.

Single User
MIL101

\$99

Multi User
Call for pricing

CORPORATE



MBNET - the Millenium Buster Client Server program for experienced network administrators. MBNet contains both the test and the fix, which can be run on all workstations from the server. For more information, please call our Major Accounts team on 1 300 300 003.

5 User Client Server
MIL102

\$199

Call for extra user details

NEW HARDWARE FIX!

What if you want a hardware fix to make you Year 2000 compliant? You could spend \$3000 on a new PC, but it may not be compliant. You could spend \$700 on a new motherboard and processor, but again it does not guarantee compliancy, and also means that you will have to re-install all your hardware, drivers etc. Or you could spend \$595 on the Millenium Buster Year 2000 Enhancement Card. The Year 2000 PC Enhancement Card is a highly sophisticated card that utilises the latest Dallas Semiconductor fully Year 2000 compliant Clock Chip. An ISA card that installs in most PCs in approximately 10 minutes, it is recommended for use in network servers and mission critical PCs.

MIL103 Millenium Buster PC Enhancement Card

\$595

Call for volume pricing

ATTENTION I.T. MANAGERS: Worried about the millenium bug and your network? Call our major accounts team on 1 300 300 003. Millenium Buster is used by many Blue Chip organisations.

YEAR 2000 - AN OPEN LETTER TO OUR VALUED CUSTOMERS

If you're confused, I'm not surprised. There is so much hype surrounding the year 2000 problem that it's often difficult to navigate your way to an honest conclusion. Briefly, let's start with what it's not: it's not a hoax. It's not being made up by the computer industry to sell more computers and software, and it's not exclusively the computer industry's problem. And it is certainly not going to go away.

As one of the leading mail order suppliers of PC Software and peripherals in both Australia and the UK, International Software Warehouse is committed to working with our customers in addressing the challenge of the Year 2000 millennium date change.

The challenge relates not only to shrink wrap software packages that are reliant on 4 digit short cut dates, but to the underlying IBM PC compatible hardware Bios (Real Time Clock CMOS) and Operating System compliance.

International Software Warehouse is currently working with its suppliers in following the guidelines set by Standards Australia and Standards New Zealand (SAA/SNZ MP77:1998), who have adopted the British Standard Institute's Document DISC PD 2000-1 verbatim. This code dictates that the onus is upon the manufacturers of computer software to ensure that the programs are compliant.

As part of our commitment to providing our customers with the very highest level of service, we have produced a free brochure explaining the implications of the Year 2000 challenge to small and large businesses alike. In the brochure you will find the necessary advice, tools, products and services with which your organisation can effectively implement Year 2000 risk assessment and compliance before December 1999. For a copy of the brochure, call our Major Accounts team on 1 300 300 003.

Phil Webb

Phil Webb
Managing Director
International Software Warehouse



Free brochure on the implications of the Year 2000 Challenge, and how to deal with them.

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FIND IT CHEAPER? CALL US - WE WON'T BE BEATEN!*

CHECK 2000 PC Deluxe



The Ultimate tool for beating the Millennium Bug!

Check 2000 PC Deluxe is the only integrated year 2000 testing tool that addresses all five "at-risk" layers of your PC. You can correct the BIOS, test the operating system and software programs, scan your data files, and flag data importing issues.

CHECK 2000 PC Deluxe gives you more:

- ✓ Finds and corrects year 2000 hardware (BIOS) problems on the spot
- ✓ Flags problems in software programs, includes the world's largest database of remediation advice
- ✓ Lets you check new data from e-mail, internet, disks, CDs and other outside sources as often as you like
- ✓ Scans all the way down to individual cells in spreadsheets, databases, and other data files
- ✓ Helps you prioritize software and data problems for timely repair

"Today CHECK 2000 is established as the standard by which other year 2000 products are measured" *Microsoft Y2K Resource Centre.*

Greenwich Mean Time

Greenwich Mean Time

STOCKCODE: GRE002

\$85

1 Test and Correct BIOS

A simple pass/fail screen tells you if your BIOS passes or fails the critical date tests. Then Check 2000 PC Deluxe will correct the problems for you in 98% of BIOS types.

2 Check your operating System

Check 2000 will test your operating system, identify any 2-digit settings, and then recommend the changes you need to make. We check all of the popular operating systems, including: Win95/98, NT 4.0.

3 Analyse Software Programs

Every application treats date-dependent data a little differently. Check 2000 PC Deluxe will do an inventory on your application programs - and show you which programs are most at risk (usually it's spreadsheets, databases, and schedulers). Year 2000 advice is provided on over 5,000 software programs. The knowledge base built into Check 2000 PC Deluxe recognises over 20,000 programs.

4 Pinpoint and Prevent Data Problems

Drill all the way down to the individual cells in spreadsheets- and other data files- that could cause problems. Correct the data as it's revealed to you by Check 2000, without switching between software programs. You can run the Data Scanner at any time, to continually reveal any new date-dependent data that comes into your PC.

5 Keep Checking Imported Data

Check 2000 PC Deluxe identifies software programs that import and export data. Then Data Scanner finds date-dependent data so you can correct it.

CHECK 2000 PC Client Server

Flags and fixes year 2000 PC problems

- Fixes your hardware
- Analyses your software
- Provides detailed advice



What CHECK 2000 PC does for you:

- Finds and eliminates hardware date problems in 98% of BIOS types by correcting the PC BIOS system clock.
- Tells you how your data and software will be affected by the year 2000 changeover.
- Gives advice on avoiding problems inherent in many thousands of popular software programs.
- Helps you prioritise software and data problems for timely repair.

- Lets you run the program as many times as you like to keep monitoring your year 2000 status
- Provides free technical support for 90 days.
- Compatible with Win 3.1/3.11, Win 95, Win NT 3.x, Win NT 4.0.

Scans your network to find and fix Year 2000 PC problems

Only Check 2000 Client Server does all this and more...

- Performs a detailed hardware and software audit of your network
- Scans spreadsheets and databases for year 2000 problems, drilling down to individual cells
- Finds and Fixes critical (BIOS) problems on your network
- Collates network data into one common database
- Supplies a top-down view of your year 2000 readiness
- Provides detailed reports for all levels of your enterprise, from management to technical

Prioritizes software and data problems for timely repair

Offers

- ongoing risk assessment to maintain your protection, as you change and add to your network.
- The client server software will run on the following operating systems: DOS, Win 3.1x (including for workgroups), Win 95 and Win NT 4.0



MasterClips 35,000

Unbeatable value for money, this two CD program contains 33,000 high quality vector images and more - for only **\$19.95!**



IMS016

- 33,000 fully scalable vector images
- 1,000 stunning photos
- 1,000 incredible True Type fonts
- 150 of the most popular sound effects
- Full library of video and animation clips

And it's all at your fingertips with MasterClips MediaPac Browser. The browser's extensive import capabilities (up to 36 formats supported) allows you to preview, view, file, manipulate, listen to or watch any image, font, photo, video clip, sound effect or animation on electronic media with ease.

Sanaz



GRE001 Check 2000 PC

\$75

GRE005 Check 2000 Client Server

\$425

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OCR

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OmniPage Pro v9.0 Upgrade

The World's Best OCR Just Got Better

OmniPage Pro 9.0, the latest version of the world's best-selling optical character recognition (OCR) software, lets you quickly and easily convert scanned pages into computer-editable documents, more accurately than ever before. Other new features include enhanced integration with Microsoft Word, and multithreading for faster processing.



OMN021
OmniPage Pro
9.0 U/G OEM

ONLY \$199
(oem) when purchased
with a scanner

Superior Integration

Superior Integration with MS Word. Now you can perform all your OCR functions directly from Microsoft Word - and proof your results by comparing them to the original image. You can also share a dictionary with Word, so you never have to add a word twice.

Easy, One Button OCR

With just one click of a button, our AutoOCR Toolbar guides you through the entire OCR process. Or simply let our OCR Wizard do it for you. Nothing could be easier!

Colour

For the first time ever, OmniPage Pro lets you scan colour documents and save colour graphics into your word processor.

Maximum Zone Flexibility

New OmniPage Pro 9.0 identifies regions of text and graphics on a page to improve recognition and formatting. Let OmniPage Pro find them for you, and then you can add, delete, move, combine and split them any way you want.

Automatic Proofreader

Automatically checks your OCR results within OmniPage Pro or Microsoft Word and displays the original image for comparison. Like a spell checker, it highlights suspicious words and suggests corrections.

Retains Original Page Layout

OmniPage Pro's enhanced True Page preserves your documents' original "look and feel." By maintaining your layout (columns, graphics, tables, etc.) and your text style (font, size, bold, italics, etc.), you can keep the original layout with a lot less work.

PageKeeper

OmniPage Pro 9.0 also comes with PageKeeper Standard - the easiest way to organise and find scanned and electronic documents. If you work with scanned pages, Microsoft Word files, Web pages or photos, PageKeeper is a must! Manage any type of document: PageKeeper organise scanned pages, Word files, photos, spreadsheets, brochures, Web pages, articles... Easy to organise and retrieve: Organise files any way you want. To retrieve, simply enter any keyword and PageKeeper will find all documents containing that word and give you thumbnails of those documents. Then click the document you want to work with.

* box shown for display purposes only.



Tables and Spreadsheets

OmniPage Pro 9.0 automatically detects tables within documents and preserves them as table objects in Word and WordPerfect. And now you can save spreadsheets directly to Excel, 1-2-3 or Quattro Pro with formatting just like the original.

Over 99% Accurate

OmniPage Pro 9.0 makes a quantum leap in OCR accuracy. Major improvements in our OCR technology mean you can accurately recognise a greater variety of documents, with far fewer errors:

- * Letters, articles, reports, memos
- * Very small text and number
- * Even poor-quality copies and degraded faxes...

Plus More...

- 15% faster on MMX and Pentium II processors
- Integrates with image editors like Adobe PhotoDeluxe and others
- Scan directly to any application
- HTML output
- See side of box for a complete feature-comparison chart

OMN020 OmniPage 9.0 U/G.....Upgrade from ANY OCR software.....**\$209**



OmniForm 3.0

The Easy Way to Make Forms Electronic

Electronic forms by OmniForm have a lot of advantages over paper forms. And they're so easy to create! Just scan in a paper form, and seconds later there's the form on your computer screen, ready to be filled out, edited, stored, printed, e-mailed - whatever you want to do with it! Or, design a whole new form! OmniForm 3.0 is a low-cost, complete forms solution you can use immediately.

Key features:

- Form Assistant guides you through the steps
- Instantly generate fillable, editable forms
- Tab and type to fill in your forms
- Easily edit and modify forms

- Fill forms quickly with Type Ahead
- Check spelling and perform calculations
- Automatically create a database
- Print, fax, e-mail, and route forms easily
- Open, edit, and fill forms in Microsoft Word



OMN014 OmniForm 3.0

\$299

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DON'T FORGET TO ASK FOR YOUR FREE GIFT

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The easiest scanner for home

If you need an easy scanning solution, try the HP ScanJet 4100C. Everything you need for unmatched ease and convenience is right in the box, including software to scan, copy, make changes, store or print.

- Guided workflow for quick results.
- Front panel scan and copy buttons.
- Easy to set up and fast operation with Universal Serial Bus (USB).
- 4100C Features**
 - Push button scanning
 - Dual image scanning



ONLY \$289

HP5030 HP ScanJet 4100C

HP ScanJet 5100C

Highest productivity for business



- Completes scan job twice as fast as before.
- Scan line art for enlargement with no loss of quality.
- Complete business solution for electronic document creation and management.
- All the features of the 4100C plus:**
 - Line art enhancement
 - Preview outline by region type
 - Auto page format retention

HP5010 HP ScanJet 5100C... **\$469**

HP OfficeJet Pro 1170C

Here's the perfect way to get the best performance for your office and professional needs. The OfficeJet Pro 1170C gives you all the capabilities of a full range of office equipment in one powerful business tool. You get a colour printer, colour scanner and colour copier. What's more, they're fast, easy and convenient to use - and extremely reliable.



- Features**
- Printing speeds up to 9ppm black and 5ppm colour
 - PhotoREt II photo-realistic printing for brilliant, vivid colours
 - Prints on a variety of papers: letter, legal and A4 sizes: plain, transparency, photo, envelopes, labels, cards, and iron-on T-shirt transfers
 - Caere OmniPage Limited Edition OCR software for scanning in text
 - Built-in flatbed scanner lets you scan just about anything, as well as copy books, magazines and single pages
 - Advanced copy features such as clone, poster, mirror, auto-enlarge and super zoom

HWP360 HP OfficeJet Pro 1170C... **\$1375**

HP OfficeJet Pro 1175C

All the features of the 1170C, plus PC-assisted faxing and a 30-page automatic document feeder!



HWP362 HP OfficeJet Pro 1175C... **\$1765**

HP ScanJet 6200C

Best image quality for professionals



- Increases productivity by up to 4 times over comparable scanners.
- Networkable scanner for high workgroup productivity
- Capable of unlimited enhanced resolution for quality image capturing
- USB/SCSI capable
- All the features of the 5100C plus:**
 - HP PrecisionScan LAN for network sharing
 - Intelligent Assistance
 - Unlimited enhanced resolution
 - Advanced imaging controls
 - 35mm slide scanning

HP5020 HP ScanJet 6200C... **\$749**

HP ScanJet 6250C

Best image quality and maximum productivity for professionals



- A powerful networkable scanner for high workgroup productivity.
- Integrated automatic document feeder for multi-page scanning
- Increases productivity by up to 4 times over comparable scanners.
- Capable of unlimited enhanced resolution for quality image capturing
- USB/SCSI capable
- All the features of the 6200C plus:**
 - 25 page automatic document feeder (215mm x 356mm)

HP5021 HP ScanJet 6250C... **\$949**

HP OfficeJet 635

Four in one system, Colour Printer, Fax Copier and Scanner

Completing your work in colour is now convenient and easy. The HP OfficeJet 635 prints, scans and copies in colour, making it simple to impress customers or clients. Plus, it's a plain paper fax. You get four essential office devices in one powerful package. The HP OfficeJet 635 can easily share the same telephone line as a phone and/or answering machine. The distinctive ring feature detects the appropriate incoming signal and automatically switches functions. After a one-time software installation onto a connected computer, you may use the fax functions either from the PC or the touchpad, and use the HP OfficeJet 635 as a standalone fax machine. Faxes can be sent and received even when the computer is turned off.



- Features**
- All-in-One - business-quality colour and B&W printing, plain paper and PC faxing, easy-to-use colour scanning, including OCR, convenient versatile colour copying with reduce/enlarge.
 - Print - Up to 5 ppm B&W and 2 ppm colour, versatile printing on plain paper (letter, legal and A4), transparencies, glossy paper, premium inkjet paper, envelopes, labels and card stock.
 - Fax - 20-page automatic document feeder, up to 100 speed dials for fast faxing, and automatic phone/fax/answering machine switching.
 - Scan - 256 levels of gray for near photo-quality images, TWAIN compatible for easy insertion of images into your software applications, Caere.

- OmniPage/E Limited Edition OCR software.
- Copy - Up to 99 copies from one original, reduce, enlarge or make full-size multiple colour copies, digital copying technology uses an image-processing chip to ensure the highest quality copies, makes B&W copies independent of the PC after setup (requires PC to be on for colour copies)

HWP213 HP OfficeJet 635

\$815

HP OfficeJet 710

Four in one system, Colour Printer, Fax Copier and Scanner - All in Colour!

In addition to the benefits of the HP OfficeJet 635, the HP OfficeJet 710 makes it even easier to impress your customers and clients. Not only does the HP OfficeJet 710 offer standalone black and white faxing, but it also features PC-assisted colour faxing and large multi-page memory!



\$975

HWP369 HP OfficeJet 710

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HP1007 51649AA CLR	\$59
AUC114 C1816AA PHOTO	\$65
AUC108 C4583A KIT CLR	\$95
AUC123 51641AA CLR	\$59
HWP344 C1823AA CLR	\$69
AUC111 51625AA CLR	\$59
HP1016 51629GA BLK	\$35
HP1006 51626AA BLK	\$59
HP1008 51629AA BLK	\$59
AUC118 51640AA BLK	\$59

HP Toner

AUC125 C3906A	\$99
AUC134 C3909A	\$279
AUC127 92275A	\$165
HWP056 92298A	\$155
AUC124 92274A	\$135
AUC126 C3903A	\$145
HWP001 C4092A	\$109

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3COM PALM III



Stay organised, wherever you go! The 3COM Palm III is the latest version of the award winning range of personal organisers from 3COM. Weighing in at an amazing 126 grams (approx. 160 grams including the batteries) and measuring 12cm by 8cm by 2cm, the Palm III can:

- Store 6000 addresses
- 5 years of appointments
- 1500 to do items
- 1500 memos
- 200 emails

It includes an address book, date book, to do list, memo pad, expense report templates, calculator, security options and some bonus games. Powerful enough to keep you organised. Small enough to fit in your pocket. The amazing Palm III from 3COM.

US\$51 **\$679**



MICROTEK High-Tech SCANNERS

MICROTEK ScanMaker 4



The new MICROTEK ScanMaker 4 is 2 scanners in 1. It's both a professional quality flatbed scanner and a transparency scanner using Microtek's patented E.D.I.T. technology! Special film holders are used to scan slides & transparencies directly inside the scanner, thereby eliminating the loss of optical quality caused by glass. It also offers a robust design, fast and quiet operation, 36 bit colour and a professional scanning software with ColorSync colour management, and much more!

PRO528 Microtek ScanMaker4 **\$1679**

MICROTEK 35T Plus 35mm Slide Scanner

- High-speed, high-resolution Slide Scanner
- 3,900 x 1,950 DPI Optical
- 3,900 DPI Interpolated
- Scans both negatives and positives
- Scans strips or mounted slides
- Imaging Magazine Editor's choice



35mm slides are far more difficult to scan than standard photos. The 35T Plus is designed to scan purely 35mm slides, delivering not only the higher resolution required for slides, but also by eliminating the use of mirrors and glass, it delivers much sharper images.

PRO504 Microtek 35T Plus **\$999**

MICROTEK ScanMaker X6

The Microtek ScanMaker X6 offers a sharper image, much higher resolution, superior colour accuracy and much better shadow detail compared to entry level scanners. The benefits are clearly apparent when scanning line art (e.g. logos or line drawings), when you require enlargement of your original, when scanning transparencies or difficult colour photos. A better scanner also means you don't waste your time correcting every scan.

To make sure the X6 offers unbeatable value, an exceptional collection of quality software is offered. This includes Windows software for image editing, OCR (text recognition), document



management, a program to create your own digital photo albums, a utility to SCAN to Print/Fax, a large library of backgrounds and stock photography, and great software to automatically blend your pictures with calendars, greeting cards, etc...

For Windows users, a genuine Adaptec 1505AE SCSI card is supplied which lets you daisy chain other external SCSI devices (e.g. SCSI Zip drive, tape drive, CD writer, slide scanner).

Parallel Version Now Available

- Higher resolution than HP 6100C!
- 36 bit colour input and processing (1 pass)
- 1, 8, 12, 24 or 36 bit output
- 4 times the definition of entry level scanners
- 1200 x 600 DPI Optical
- 9,600 DPI Interpolated
- 720,000 dot measured per square inch!
- A4 Size

- FlexScan lid
- Zero Reflection Design
- Advanced Image Enhancer
- Great bundled software
- Includes Adaptec 1505AE SCSI
- Tri-linear CCD sensor array
- Dynamic range: 3.2
- 12 months warranty



PRO526 Microtek ScanMaker X6 Parallel **\$499**
PRO523 Microtek ScanMaker X6 SCSI **\$499**

X Pagis Pro 2.0 4 Powerful Scanning Products In 1 Easy To Use Program!

The ultimate scanning suite for both photos & documents!

More than high quality colour scanning, Pagis Pro 2.0 offers incredible time-saving features like visual filing, Pro OCR, photo-editing, colour copying, faxing, forms fill-in, annotations, easy E-mailing of colour photos and so much more. Now discover all the ways Pagis Pro will make your scanner more valuable.

1 Instantly Organise Photos & Documents

Now easily scan and file your family photos, tax receipts, articles, letters, records and more - Pagis Pro puts everything right into your Microsoft Explorer file folders. Find anything fast! Visual thumbnails and searching by content helps you find anything as quickly as you filed it!

2 Eliminate Retyping with TextBridge Pro 98 OCR

Turn paper documents into text and pictures you can edit in your favourite word processor. Xerox' incredibly accurate TextBridge Pro 98 is the winner of PC Magazine's Editors' Choice Award for best OCR package.

3 Get Creative With Your Photos

Double click on any photo to launch MGI PhotoSuite within the Pagis Editor. Enjoy the advanced colour controls, photo retouching tools, special effects, lens filters and more! Plus you can easily make calendars, posters and greeting cards!

4 One-Button Colour Copies

Make quality colour copies right at your desktop. Simply place any document on your scanner and then click the green button to make a copy on your colour printer.

Features

- Scan - Get paper & photos into your PC in seconds - plus you can scan directly into Windows applications like MS Word, Photoshop & nearly 150 others.
- Photo Editing - Easily edit, retouch and get creative with photos! Includes free template for calendars and greeting cards.
- XIFF 3.0 - The eXtended Image File Format 3.0 recognises text and pictures as well as colour text and background patterns.
- Fill-in Forms - Quickly fill-in forms you scan, just tab and type!
- File - Instantly organises everything you scan right inside Microsoft Window Explorer folders!
- Send - Easily fax an article, E-mail photos or even create documents for the Web!
- Find - Scan anything and easily find it later - including removable media!

Your All-In-One Scanning Suite! XEROX



4 Powerful Scanning Products In 1 Easy To Use Program!

STOCK CODE: XERO05

\$229

All prices INCLUDE sales tax. Prices subject to change, see page 48 for terms & conditions.

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For the cost of a local call Orderline 1300 300 003 or 02 9700 8800

Sales Lines Open 9am 'til 6pm Monday to Friday and 10am 'til 3pm Saturday.



INTERNATIONAL SOFTWARE WAREHOUSE Pty. Ltd.

Scanners/
Storage

FIND IT CHEAPER? CALL US - WE WON'T BE BEATEN!*

UMAX® Flatbed Scanner only \$149

UMAX Astra 610 Series Scanner

The plug 'n' play flatbed scanner that adds colour and life to your documents!

Add the colour and vitality of images to everything you do on your computer with the Astra 610 series scanners from UMAX. After plugging the scanner in and installing the software, simply turn it on and you're ready to go - it's that easy! Designed especially with the home or small office user in mind, the Astra 610P or 610S are sleek, compact, affordable scanners that fit right there on your desktop.

The diverse range of user friendly software bundled with the Astra 610 makes light work of any task. Whether you are scanning your favourite photo to e-mail to friends or using OCR to scan text for an assignment, it can all be done at the push of a button with the easy to use UMAX Astra 610 series!

Features

- 600x300 dpi optical resolution for crisp, vibrant images
- 4800 dpi max. resolution for smooth lineart and image magnification
- 30 bit colour depth captures over 1 billion colours
- 216mm x 297 scan area (A4)
- Single pass colour CCD for fast productivity
- Your choice of SCSI or Parallel port (PC only) interface

Includes Free Software

- Adobe PhotoDeluxe
- UMAX VistaScan
- Caere Omnipage OCR
- Presto! PhotoAlbum (Win only)
- Presto! PageManager



Amazing Value!!

UMAX Astra 1220 Series Scanner

The ideal scanning solution for the SOHO or Corporate user!

If you're looking for a scanner with speed, quality and reliability, look no further than the Astra 1220 Series. Incorporating UMAX's exclusive Bit Enhancement Technology (BET™), scanned images are given greater clarity, sharpness and colour depth, guaranteeing a better quality image every time! Designed specifically for the Corporate or SOHO user who demand more from their scanner, The Astra 1220 Series scanner is the ideal Corporate colour scanning solution!

Features

- 1200x600 dpi optical resolution
- 9600 dpi max. resolution
- 36 bit colour depth (with BET™)
- 216mm x 297 scan area (A4)
- Your choice of SCSI, Parallel (PC) or USB connectivity
- Optional Transparency adaptor

Software

- Adobe PhotoDeluxe
- UMAX VistaScan
- Caere Omnipage OCR
- Presto! PhotoAlbum (Win only)
- Presto! PageManager



UMA011 UMAX Astra 610P (Parallel interface).

\$149

UMA013 UMAX Astra 610S (SCSI interface)

\$279

UMA014 UMAX Astra 1220P (Parallel).....

\$279

UMA015 UMAX Astra 1220S (SCSI).....

\$499

UMA012 UMAX Astra 1220U (USB).....

\$329

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Hard Drive U/G Pack

Everything You Need for a Successful and Easy Drive Installation on your Pentium PC.



Seagate hard drive kits are customer-focused, to bring you affordable high-capacity storage solutions. Each Ultra-ATA hard drive comes with a three year warranty, and is fully tested to ensure compatibility, reliability and exceptional quality. Seagate hard drive kits provide you with everything you need to get your new drive up and running.

The upgrade pack includes:

- Seagate Ultra-ATA Hard Drive
- Full step-by-step installation guide. Never opened your computer before? Don't worry. This step by step guide will take you through it, from installing the drive to loading your software.
- Frame kit, screws and mounting brackets. Ever gone to upgrade your PC, only to find that you haven't got all the bits you needed? Not with this kit! Everything is included.
- Wrist Strap. Don't blow your machine up with static electricity! The guide explains how to use the wrist strap to prevent static electricity from destroying your CPU or your RAM when installing your new hard drive.
- EACH SEAGATE HARD DRIVE KIT COMES WITH A 3 YEAR WARRANTY, SO YOU CAN BUY WITH CONFIDENCE.

SEAGATE MODEL	ST34321A	ST36531A	ST38641A	ST310240A
FORMATTED CAPACITY	4300MB	6500MB	8600MB	10240MB
AVERAGE LATENCY	6.67msec	5.56msec	5.56msec	5.56msec
SPINDLE SPEED	5400RPM	5400RPM	5400RPM	5400RPM
DATA BUFFER	128K	128K	128K	128K
FORM FACTOR	2.54mm	2.54mm	2.54mm	2.54mm
PIO BURST (MB/S)	UP TO 33M	UP TO 33M	UP TO 33M	UP TO 33

SEA161 Seagate 4.3GB Ultra ATA-Kit

\$339

SEA162 Seagate 6.5GB Ultra-ATA Kit

\$389

SEA164 Seagate 8.6GB Ultra-ATA Kit

\$459

SEA166 Seagate 10.2GB Ultra-ATA Kit

\$509

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Sydney 2015

Enquiries 02 9700 8800 Internet site www.iswh.com.au

SO WHO ARE UMAX?

Umax are the most popular scanners in the USA, and world leaders in imaging and computer technologies. And they are now available to PC users in Australia. Umax provide a complete range of scanners, from the price leading 610p, right through to high end professional flatbed solutions. International Software Warehouse can tailor a scanner to suit your needs, so call 1 300 300 003 with your requirements. Umax also supply high quality monitors at an affordable price.

Maxvision B5

15 inch FST, 0.28mm dot pitch, Non glare, 1280 x 1024 @ 70Hz max NI



UMA016\$349

Maxvision B7

17 inch FST, 0.27mm dot pitch, Non glare, 1280 x 1024 @ 70Hz Max NI



UMA017\$849

Maxvision B7 Plus

17 inch FST, 0.25mm dot pitch, Non glare dark glass, 1600 x 1200 @ 87Hz Max NI, Standby power switch

UMA018\$1349

Irena



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At International Software Warehouse, our commitment to value doesn't stop at selling cheaper than everyone else. It means we actually go out and find top notch deals to save YOU money! Many of our customers have asked us to get deals on name brand CD write and re-write media. So here they are!

Kodak CD-R 5 pack	
KOD036	\$16
Kodak CD-R 10 pack	
KOD037	\$30
Kodak CD-R 25 pack	
KOD038	\$70
Kodak CD-R 50 pack	
KOD039	\$135



Princo CD-RW single	
PR1010	\$15
Princo CD-RW 5 pack	
PR1011	\$65
Princo CD-RW 10 pack	
PR1012	\$115

NO IT ISN'T A MISPRINT! CD REWRITE MEDIA FROM \$15!

**HP CD-Writer Plus 8100i****The fastest, easiest way to make your own CDs.**

With up to 24X read speed and up to 4X write speed, the new HP CD-Writer Plus 8100i offers unprecedented performance in CD-Recordable technology. Now, in addition to being able to create your own CDs as simply as using floppies, you can do it faster. What's more, the HP CD-Writer Plus 8100i lets you read CDs at speeds rivaling 24X CD-ROM drives. And now there's no more long waits to format your CD-RW discs. With HP fast format, formatting CD-RW takes less than five minutes, saving up to one hour or more. From start to finish, the HP CD-Writer Plus 8100i is designed for high performance.



- Use it just like a floppy - Write, update and rewrite your files thousands of times on a single 650Mb disc.
- Drag and drop files to CD or save directly to CD from any application
- Improved Performance! Read at up to 24X; Write at 4X speed; ReWrite at 2X

• World-class quality and support from Hewlett-Packard, the most trusted name in computer peripherals.

Software Features:

- HP fast format - Allows you to write CD-RW discs in under five minutes, saving you up to an hour of formatting.
- Adaptec Direct CD, Easy CD Creator, Easy CD Audio, Jewel Case Designer - Makes it easy to record data, photo, audio and video files to a CD. Allows you to copy, transport and share your CD creations with others. Design custom jewel case inserts and labels to complement your CDs.
- HP Disaster Recovery - Helps you quickly restore operating systems, custom software settings, and data files on your hard drive
- HP Simple Trax - Helps you back up your files to CD, and then makes it easy for you to quickly locate and retrieve them. Without having to insert the CDs, you can determine which backup CD contains the file you need.

HPP031 HP CD-WRITER PLUS 8100i **\$835**

HP SureStore CD-Re Writable 7200i/7200e**Simple as a floppy, all the qualities of a CD.**

CD-Writer Plus lets you store, organize, share and distribute information like never before.

You can use versatile CD-RW media. Think of it as a high capacity, durable floppy. Write, update, erase and rewrite up to 650Mb of words, images, video and sound on a single CD up to 1000 times per sector per disc. Create permanent archives of all your critical data with the assurance that it will be secure for up to 100 years. Or create CDs that can play in millions of CD-ROM and Audio CD players worldwide.



Designed for
Microsoft
Windows NT
Windows 95

Now including:

- Adobe PhotoDeluxe
- Documagic PaperMaster Live
- PhotoOrganiser
- Corel Print House Magic
- Norton AntiVirus
- HP Simple Trax

PLUS all the software packages that were included with the 7100, such as:

- Adaptec Direct CD - drag and drop files to CD from Windows Explorer or save directly from any application
- Adaptec Easy CD Creator - Master CDs which can be read on CD-ROMs using Windows 95, Windows NT, Windows 3x, Macintosh and UNIX operating systems.
- Adaptec Easy CD Audio - Create music CDs
- Adaptec Jewel Case Designer - Create inserts and labels for CDs

Includes Great Software Bundle Valued Over \$300

HPP011 HP Surestore CD-RW 7200i Internal	\$635
HPP012 HP Surestore CD-RW 7200e External	\$885
HWP252 HP CD-RW Media Single Pack	\$29
HPP014 HP CD-R Recordable Media 650Mb 5 Pack	\$19

SONY 24x4x2x CD REWRITER KIT

Another great deal for February. Get the Sony CRX100 Rewriter Kit for just \$649! This kit contains everything you need to get you up and running, including:

- Tray load drive
- 1 x Sony CD-R disc
- 1 x Sony CD-RW disc
- CD authoring software
- Audio cable
- User guide

SONY45

\$649

A blistering 24x read speed coupled with a 4x write once speed and 2x rewrite speed makes this the total CD/CD-R/CD-RW solution.

**PROKIT 8x4x SCSI CD-R KIT**

This professional CD-R kit contains everything you need to start creating your own CDs. This fantastic offer includes:

- SCSI 8x read 4x write drive
- PCI SCSI controller card and cable
- WinonCDToGo v4.0 authoring software
- 2 blank CD-Rs
- Mounting kit (internal drive)
- Installation and Quick Start guide

PRK001 Prokit SCSI 8x4x CD-R Kit Internal **\$549**

PRK002 Prokit SCSI 8x4x CD-R Kit External **\$799**

Another great offer from International Software Warehouse.

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Storage

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ZIP

A Zip drive is sold every 5 seconds!

The SuperFloppy used by millions - now for USB connections!

The perfect companion for iMac & PCs with windows 98.



What can you do with Zip disks?

Zip disks are big enough to handle just about anything. Whether you've got family photos, downloads from the Internet or your favourite music, Zip disks have tons of room to hold it all. Unlike CD-ROMS, you can rewrite to Zip disks. And with a Zip drive sold every 5 seconds, you can rely on having access to your stuff, virtually anytime, anywhere.

Zip Starter Kits

Everything you need to get started:

Parallel port Zip drive

- back up your hard drive
- take your stuff with you
- use it like a hard drive

4 genuine multicoloured 100MB Zip disks

- each disk holds up to 70 floppies
- great for multimedia
- colours help organise

RecordIt software

- for voice and music

IOM096 Zip Starter Kit (Parallel port)

\$299

- Easy to connect - just plug it into your USB port, and you're ready to go
- Hot swappable - switch with other USB devices without turning off your computer
- Fast, unlimited capacity - add 100MB* at a time
- Reliable - use it like your hard drive - save your files and run your software
- Compatible with 100MB* Zip disks - over 100 million disks sold

IOM098 Zip Drive (USB)

\$299

For more information on which drive is right for you, contact our sales team on 1300 300 003

IOM022 Zip Drive External (Parallel port).....

\$239

IOM020 Zip Drive External (SCSI Port)

\$239

IOM095 Zip Internal ATAPI.....

\$199

*100MB capacity where 1MB=1million bytes. The capacity reported by your operating system may differ.



Who said size doesn't matter?



Get a \$95 JAZ TRAVELLER - FREE!

Multimedia Producer

Buz puts you in the director's chair!

Capture, Edit and Share video, digital photos, and sound using your computer.

- Get your multimedia stuff into your PC
 - Personalise it using the easiest software around
 - Share it with others using Zip or Jaz disks, VCR tape or even the Internet
- Buz is a unique combination of hardware, software, tutorials, and high performance working together to let you produce your own cool multimedia projects. Create world-class presentations, home movies, capture, edit, add music and audio to your videos, and even create multimedia for Web sites. All on your PC.
- What can you do with Buz? You're limited only by your imagination.
- Capture Audio/Video and digital photos from a variety of sources
 - Get video from camcorders, VCRs, laserdiscs, or DVD
 - Get images from scanners, CD-ROM, or Jaz and Zip disks with Buz's Ultra SCSI connection
 - Capture audio from microphones, CDs or tapes.



Jaz 2GB is both read write compatible with Jaz 1 GB

And from now until March 31st, every Jaz 2GB External Drive comes with a free Jaz Traveller worth \$95, which gives you both SCSI and Parallel connection!

IOM083 JAZ 2GB Ext.....

\$759

IOM082 JAZ 2 GB Int.....

\$759

IOM080 Buz.....

\$359

IOM115 Buz for Mac

\$599

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iomega

Accessories & Media

JAZ Traveller

AUP163\$95

ZIP Wallet (Holds 6 Disks)

IOM112\$29



ZIP 100Mb Disks PC 10-PK

IOM030\$199

ZIP 100Mb Disks MAC 10-PK

IOM074\$199

ZIP 100Mb Disk MAC 1-PK

IOM086\$25

ZIP 100Mb Disk PC 1-PK

IOM085\$25

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Gigacolor Disks 2-PK

IOM099\$45



JAZ 1Gb Disk PC 3-PK

IOM032\$569

JAZ 2Gb Disk PC 1-PK

IOM097\$199

JAZ 2Gb Disk MAC 1-PK

IOM006\$199

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IOM089\$589

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IOM078\$589

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Logitech QuickCam Home

Internet video. Make contact.

Share the moment in the moment. With the new QuickCam Home from Logitech, quickly record and send video mail to your brother in Milan. Let Grandpa in on the fun with a live Internet video call when little Melissa pours the contents of her cereal bowl over her head. Or do the obvious and send pictures of yourself to all your friends. It's really simple. QuickCam Home is a USB device that runs under Windows 98 for a true plug-and-play experience. Its built-in microphone and TrueView design makes meeting face-to-face online completely natural. So see what you can do. And let others see it, too.

With Logitech QuickCam Home:

- Capture colourful full-motion video and sharp, still images

- Send photos and video mail instantly over the Internet
- Make live Internet video calls - meet face to face online
- Includes Built-in microphone for easy conversation
- Plugs right into your PC



LOG050 Logitech QuickCam Home

\$269

LOG051 Logitech QuickCam Home OEM*

\$189

* OEM product only available with the purchase of any Notebook or PC from ISW. OEM version does not include any games.

ANOTHER BLOCKBUSTER FROM INTERNATIONAL SOFTWARE WAREHOUSE!

KODAK DC200 DIGITAL CAMERA FOR ONLY \$799!

"Finished file" capability enables easy transfer of pictures from the camera to the computer through a PC card reader and software that supports JPEG and / or FlashPix(tm) images files.

TV/Video output capability (NTSC or PAL video formats) provides easy review of pictures through a video monitor or television.

A 4MB CompactFlash removable memory card stores up to 60 pictures in low resolution, and 13 images in high resolution.



Kodak digital science™

Technical Information:

- 1160 x 872 pixels
- Image resolution: 1152 x 864 pixels (high), 640 x 480 pixels (standard)
- Colour: 24-bit, millions of colours
- LCD Viewfinder: 1.8" TFT colour LCD for review and preview
- Flash: Built-in (automatic, fill, red-eye, fill/red-eye, off)
- Lens: Focus-free, 37mm threads accept optional lenses
- Self timer (10 sec)
- InfoLithium rechargeable battery and charger

SKOD024 Kodak DC200 Digital Camera

\$799

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Robo Snoop Bundle

Video Conferencing, Personal Surveillance/Receptionist & Message Recorder Combined, "Robo Snoop" will allow users the option to perform video conferencing, surveillance, video capture, receptionist duties & message recordings, all for a great price.

The RoboCam USB Camera delivers crystal clear pictures with the latest CMOS 300K technology.

PC Snoop integrates Stealth surveillance & Video Message Recording for Home & Office applications.



ONLY \$299 AS\$017

COMPRO PS39 Digital Video Camera

Great for:

- Personalised greeting card and t-shirt transfer
- Picture & Video E-mail
- Video Conferencing
- Internet Home Page creation
- Jazz up reports/presentations
- Picture ID
- Digital photo album and more...

Superior features:

- 40 frames per second (video images)
- 1280 x 960 resolution at 16.8 million true colour still images
- Superior image quality without compression
- Adjustable focus Lens (10mm to Infinity)
- Night vision capability
- Plug and Snap on all PC and note-book printer ports
- Includes PS2/AT Keyboard Adaptor, removable tilt and swivel base assembly, user manual

COMP005 COMPRO PS39 Digital Video Camera

\$299

Sony Mavica MVC-FD81



This is your camera.



This is your film.



This is your developer.

Shoot Still or Moving Images Straight to Floppy Disk.

Shoot still or moving images (with voiceover) straight on a 3.5" disk and email it to friends and family anywhere in the World in minutes. With the Mavica MVC-FD81, users can record XGA resolution (1024x768) still images and up to one minute of MPEG moving images onto a standard 3.5" disk with no need for special capture boards, driver software or messy cables. This new digital camera takes technology to new levels.



Features:

- Removable 3.5" 2HD floppy disk storage media
- XGA (1024x768 pixel) resolution
- Up to 20 shots fine/40 std per disk (VGA JPEG), 8 fine/16 std (XGA JPEG)
- MPEG Movie mode (up to 60 sec)
- 3x Optical Zoom lens (f5.2-15.6)
- Voice Memo mode (up to 10 sec)
- Self timer (10 sec)
- InfoLithium rechargeable battery and charger

SONY25 Sony Mavica MVC-FD81 Camera

\$1949

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KeyView Pro

The must have utility for every Windows User

Have you ever been sent an email attachment that you haven't been able to open. Frustration isn't it. Have you ever received an email attachment which has been created in a later version of a product you own? When you open it up a 1 page document it stretches out into a 250 page document. What a hassle! Well if any of these things have happened to you, then you need KeyView Pro.



It's like having 200 application in one! KeyView Pro will allow you to instantly view and print;

- Spreadsheets
- Documents
- Video and Sound Clips
- Photos
- Graphics
- ZIP/Compressed files
- MAC files
- Internet files
- Email Files
- And many more

KI5042 KeyView Pro **\$59**

Speed Surfer Internet Toolbox

Are your valuable computer files protected from dangerous Internet hackers, or from prying eyes when you send them across the Net? Do you want people to be able to track your movements on the Web? If your answer is no, then Speed Surfer's Internet Toolbox is the perfect solution! It's a one-stop quick-fix to all of your security needs.

All-in-one Internet package:

- Drag-and-drop file encryption protection to keep files confidential when sent across the Internet.
- Modem Watch, with Intelligent Port Blocking, runs regular security checks to eliminate threats to COM, modem, FTP, SMTP, Telnet, NetBIOS, HTTP and Finger ports.
- Locks down your PC to prevent 'backdoor' access from hackers.
- Surf the Web anonymously by controlling 'Cookies' left on your PC by Web sites.
- Intelligent agent technology learns your Internet habits, retrieving pages before you need them!
- Easy one-button access makes browsing a breeze - no more complicated routines to log on to your favourite Web site.



KI5044 Speed Surfer Internet Toolbox **\$55**

Internet CommSuite

FREE communication to anywhere in the world!

By seamlessly integrating all aspects of Internet Communications in one, easy-to-use interface, Internet CommSuite's leading-edge technology makes it possible for you to communicate for FREE over the Internet!

Features:

- Internet Phone lets you talk over the Internet for FREE and, if you have a camera connected to your system, you can have full-motion video sessions with others on-line for FREE.
- Internet Fax allows you to send Windows documents to any fax machine in the world and completely eliminate long distance charges.
- Internet Answering Machine takes voice and video messages when you're out.
- Spice up your emails with voice and video clips, and, because there's no special software required, you can send multimedia email to anyone.
- Turn your video camera into a security camera that sends you a 30-second email clip when motion is detected.
- Internet Answering



SM5001 Internet CommSuite **\$95**

Simplecomputing NetExpress 56 - SVD Data Fax Voice Modem



Simple NetExpress 56K V90 BAN041 **\$189**

Using the Simplecomputing NetExpress 56 to connect to the Internet will open up endless communication and exploring opportunities. High speed Access 56K V.90 modems are the fastest on the market. The NetExpress 56 is powered by Rockwell technology and supports both K56flex and V.90 modem standards. The NetExpress 56 is flash upgradable to future 56K V.90 enhancements that can be quickly downloaded, keeping your modem forever fast. The NetExpress 56 comes with a free CD-ROM that offers you everything you need to get onto the internet, including a web browser, offers from Australia's leading ISP's and email software. Not just a super-fast surfing machine, the NetExpress 56 offers all the latest modem features:

- Fax
- Voice
- Speakerphone
- Simultaneous Voice and Data

Melody



Internet WebSite in a box

WebCentral's *Web Site in a box* is the easiest way to create your company's Web Site. Included is everything required to get your business on the Internet in a matter of minutes!

The WebCentral Software Wizard, will create your site and upload it to the Internet in around 15 minutes. It can even create a secure order form and allow you to sell your products on the World Wide Web!

Web Site in a box is the solution for your business and starting at \$280* getting your business online has never been more accessible.

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Microsoft Frontpage 98
Detailed Statistics
Includes .com.au Domain Name Registration
WebCentral Wizard Software
First three Months Web Hosting included
Detailed Administrators Manual
N/A
N/A

Professional Edition

Microsoft Frontpage 98
Detailed Statistics
Includes .com.au Domain Name Registration
WebCentral Wizard Software
First three Months Web Hosting included
Detailed Administrators Manual
Support for SQL and Access Databases
Supports your own CGI and ASP Scripts

WBC001 WebCentral Standard **\$280**
WBC002 WebCentral Professional **\$370**



sales@webcentral.com.au

* This depends on the complexity of your site. Domain approval may take up to 2 days. * Support for up to 20 products is included. * Price listed is for the Standard Edition.

All prices INCLUDE sales tax. Prices subject to change, see page 48 for terms & conditions.

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EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!

**PINNACLE STUDIO
DCio PLUS**



\$679

The Studio DCio Plus is an easy to use PC video editing system. Using Microsoft DirectShow software, the Studio DCio Plus lets you preview your edits without rendering. So, when you make changes to your movie, you can view the changes instantly in a Preview Window. And when you are ready to finish your movie, Studio DCio Plus saves you even more time and drive space by only rendering the scenes that you have altered. And as the Studio DCio Plus overcomes the 2GB Video for Windows file size limitation, you can make longer movies than you can with other desktop video editing solutions. Studio DCio Plus gives both Composite and S-video inputs and outputs, allowing you to capture and output your video with VHS, S-VHS, 8mm and Hi-8 units. You can then output to CD-ROM, videotape, the Internet or even into Powerpoint presentations.

PIN024 Studio DCio Plus**\$679**



**WaveWatcher
NET-TV 98**



Watch TV or Capture Video from any CamCorder, VCR or DVD.

Watch any of your favourite TV shows in a scalable, sizeable window on your PC, while you work on other projects! WaveWatcher Net-TV 98 is cable ready, and will accept input from VCR's when there is nothing worth watching on its 125 channels. It will even play DVD.

WaveWatcher Net-TV 98 is a full motion capture card with image editing software included for personalising your pictures.

Make the most of WaveWatcher Net-TV 98's video conferencing compatibility. You can use virtually any conferencing software to take full advantage of the Internet's communications features. WaveWatcher Net-TV 98 also comes with ULEAD Media Studio Pro 2.5 V.E., which allows you to edit, morph and apply effects to your captured full-motion video.



ASS018 WaveWatcher NET-TV 98**\$249**

**AI Gotcha 2
Portable Video Capture**

Take snapshots of your favourite images from Camcorder, VCR, or other Video source in 16.7 million colours into your PC. You can use photos for multimedia presentations, web page publishing, disk-based catalogues personal photo albums, image database, digital greeting cards, newsletters, e-mails and much more. This is a simple plug-in (parallel port) and play device providing a high quality portable capture solution. By connecting to a video source, whether composite or Y/C, an extremely high quality image can be captured (1600 x 1200 dpi) into any of the supported graphic file formats.

Features

- AI Gotcha! Real-time image capture software
- Internet audio postcard
- Parallel port extension cable
- AI Gotcha hardware (NTSC/PAL)
- Video Craft Multi-Media suite of special effects
- Pass through printer connections

* for a limited time only

ASS011 AI Gotcha 2**\$145**



**Robo Snoop
Bundle**



Video Conferencing, Personal Surveillance/Receptionist & Message Recorder Combined, "Robo Snoop" will allow users the option to perform video conferencing, surveillance, video capture, receptionist duties & message recordings, all for a great price.

The RoboCam USB Camera delivers crystal clear pictures with the latest CMOS 300K technology.

PC Snoop integrates Stealth surveillance & Video Message Recording for Home & Office applications.



ONLY \$299
ASS017

**Pocket Scan
Converter (PSC 1106)**

Your business presentations on the big screen.

Using the Pocket Scan Converter in conjunction with your notebook computer (or PC), any presentation can be displayed on a TV or recorded onto video tape, making the Pocket Scan Converter ideal for business, education and training applications. This compact device simply plug into your notebook/PC and the other end into a TV/Video to put your presentations onto the big screen. And when the work is done, play computer games on your TV. Designed with flicker reduction circuitry and S-VHS support, the Pocket Scan Converter produces extremely vivid, high quality images with up to 16.8 million colours.



* for a limited time only

ASS001 PSC 1106**\$169**

Accelerate your world with Diamond

Monster Fusion

Voodoo 3D Gaming & Blistering 2D Speed!

Diamond's new Monster Fusion takes edge-of-your-seat Voodoo 3D gaming performance and fuses it with high-speed 2D acceleration - all on a single card. Based on ground breaking 3Dfx technology, Monster Fusion brings you outrageous 60 frames per second game play, state-of-the-art 3D features, and complete game support based on the most popular APIs. Your 2D presentation and Web graphics will fly on the screen in vivid color at resolutions up to 1900x1200.



Key Features:

- 3DfxTM Voodoo BansheeTM technology
- Fully integrated 3D and 2D graphics with 16MB memory
- True 128-bit Windows acceleration
- Outrageous 3D gaming performance at 60 fps
- Awesome game support: Glide, Direct3D and MiniGL
- Available in PCI and AGP models

DIA035 Diamond Monster Fusion AGP**\$329**

DIA036 Diamond Monster Fusion PCI**\$329**

Viper V550

Unprecedented 128-bit Power for 2D, 3D and Video!

Viper V550 from Diamond features unprecedented 128-bit power for state-of-the-art 2D business graphics and stunning 3D quality with high-speed game play. Based on the revolutionary NVIDIA RIVA TNTM chipset, and fully optimized for Windows 98, the Viper V550 represents the next generation in high performance graphics acceleration. Viper offers extensive multimedia features, and full support for Direct3D and OpenGL.



Key Features:

- Twin Texel engine with true single-pass multitexturing for exquisite 3D rendering
- Revolutionary 3D quality and performance for gaming and business applications
- State-of-the-art 2D acceleration with 16MB RAM and 250MHz DAC for true colour support up to 1920x1200
- Display graphics and video on your TV (retail version only)
- Available in PCI and AGP 2X
- Exciting software bundle including games and business software

DIA046 Diamond Viper V550 PCI**\$369**

DIA048 Diamond Viper V550 AGP**\$369**

Rio PMP300

Internet Music in the Palm of Your Hand!



Diamond's Rio PMP300 is the first portable MP3 music player that stores up to 60

minutes of digital-quality sound. It's smaller than an audio cassette and has no moving parts, so it never skips. Powered by a single AA battery, Rio provides up to 12 hours of continuous music playback. Goodnoise, the premier source on the net for high-quality, downloadable music, is located at

www.goodnoise.com.

Key Features:

- Palm size for easy portability
- Supports MP3 compression
- 32MB built-in flash memory
- Expandable playback time with removable flash cards
- Skip free - no moving parts
- MusicMatch Jukebox Limited Edition software for converting CD's to an MP3 format
- CD Music Sampler

DIA047 Diamond Rio PMP300**\$469**

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Graphics Cards

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Professionally Edit Your Home Videos Quickly & Easily with **STUDIO 400**

No need to take your PC apart. No need for an enormous hard drive. Just plug the Studio 400 in and start editing your movies! With Studio 400 you can:

- Change the sequence of your camcorder footage.
- Edit out unwanted footage quickly and accurately.
- Put titles and music to your video. You can even provide your own narration!
- Output to full resolution video tapes for distribution to clients, or simply to send to family and friends as a gift.
- Output to digital video. You can send movie clips (in the form of AVI files) to clients, friends or family via email. Plus you can include the clips in business presentations and on web pages.
- Act like a professional! With over 160 professional quality scene transitions, from wipes and fades to cool dissolves, people will wonder how you got so good at editing!



Stock Code: NIT013

\$699

As seen on Australia's Funniest Home Video Show

Studio 400 can run on any Pentium-based PC with Windows 95 and 16 MB RAM, 30 MB free hard disk space, a free serial (COM) port, camcorder with LANC or Panasonic 5 Pin jack and remote control VCR. You need only 150 MB free disk space to create a one hour, full-quality video tape.

*Within 60 days from date of purchase. Fulfilled directly through Hot Key. Terms and conditions apply.

Hauppauge!

Bring TV To Your PC With WinTV!

WinTV-Primio, WinTV-PCI and WinTV-Radio PCI Boards give you live video-in-a-window!

Hauppauge's WinTV Boards are single slot PCI cards with 125-channel TV-tuners. The TV-source can be from aerial or cable set top box TV. With the external audio/video inputs, you can also connect to a satellite receiver or VCR, camcorder or video camera. The WinTV Boards also extract Teletext data from the TV signal, and include VPlus, the Professional Teletext software. These PCI boards connect to your cable TV or to a TV antenna, and display live TV in a resizable window. They do this by digitizing the live video (from either the built-in 125-channel cable TV tuner or the external video-input source) using high quality 4:2:2 video sampling. The digitised video is sent over the PCI bus into the memory of a VGA display adapter, a technique which makes the WinTV PCI boards easy to install and gives a great looking TV picture!

The WinTV-Primio, WinTV-PCI and WinTV-Radio support intercast data reception and Teletext data reception. Included is our VPlus software, for multiple teletext page display and DDE (dynamic data exchange). While live video is being displayed, these boards can also extract either intercast data (Channel 7 in Sydney and Melbourne) or teletext data from the TV signal.



The WinTV PCI boards have these great features:

- Live TV-in-a-window on VGA monitors from 640 x 480 to 1600 x 1200 pixels in up to 16 million colors- unique to WinTV.
- Built-in cable ready TV tuner: a 125-channel TV tuner with automatic channel scan.
- Resize the WinTV window from icon size to full screen (or any size in between!).
- Auxiliary audio/video input connects to video cameras, VCR's and camcorders.
- Audio output can go to your sound card's Line-In connector or to self-powered speakers.
- Capture professional quality 24-bit images with 4:2:2 digitizing.

Image save formats supported: TIFF, BMP, PCX, GIF, TGA plus compressed JPEG in color or black/white at 8, 16 and 24-bits.

- Videoconference over the Internet! The WinTV PCI's video digitizer is compatible with your favorite conferencing package such as: Microsoft NetMeeting, CU-SeeMe, Smith Micro's AudioVision, VDOnet, Connectix VideoPhone, Vocaltec's iPhone, Vivo and lots more. Simply add a video camera and one of these software packages to video conference over the phone lines or the internet.
- Create high impact presentations with 320x240 AVI clip capture with real time preview. Creates high quality AVI video's in a YUV format.

HAU001 WinTV-Primio (with PAL B/G tuner and teletext)

HAU002 WinTV-PCI (with PAL B/G tuner, teletext decoder, intercast, full stereo sound)

HAU003 WinTV-Radio (with PAL B/G tuner, teletext, FM Radio, intercast)

\$199

\$269

\$349

All prices INCLUDE sales tax. Prices subject to change, see page 48 for terms & conditions.

Orderline 1300 300 003 or 02 9700 8800 Order by fax 02 9700 8801

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ONLY **\$69.95**

For professional video editing, take a look at the Studio 400 on p43

Justin



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If you have visited our website before, we invite you to take another look. You will find it has changed quite dramatically. More information, more products and more importantly, more great deals! Thousands of products, all at the best prices. Whether you are looking for information, or want to place an order, make sure you pay us a visit first!

NetComm Roadster II 56 Ultra SVD Voice, Fax, Data Modem

Using the latest telephone exchange technology, the NetComm Roadster II 56 Ultra delivers much greater speed. So now the World Wide Web is made much more exciting - with super fast downloading of graphics, games and multimedia.

With Simultaneous Voice and Data (SVD) functionality, you can speak to the person you are sending data to at the same time on the same line. This is great for conferencing and saves you time and money.

The Roadster II 56 Ultra's multipurpose speakerphone capability turns your PC into a hands free telephone (Speakerphone). Your computer can

store all your phone numbers and dial with the click of a mouse button.

On the NetComm Communication CD you will find all you need to make the most of your modem including user guide, communication software, drivers, cool games and much more.



Headset Included

STOCK CODE: NET158

\$265



Includes WinFax Pro

NET144 NetComm Flexcard PCMCIA 56K Modem.....

\$325

NET021 NetComm CardModem 33.6K

\$255

NetComm Roadster II 56 USB The Ultra Fast Voice, Fax, Data, Modem

The Roadster II 56 USB incorporates the latest serial bus technology known as USB (Universal Serial Bus). USB is an evolutionary step up from current serial ports, offering higher throughputs, TRUE Plug & Play and Auto Setup. It also does away with the need to use an external power supply, as the USB port of the computer now supplies the power to the modem directly.

USB Advantages

- No requirement for a bulky power pack and a free AC mains socket.
- One cable carries power and data, meaning less clutter on your desktop.
- Hot plugging, TRUE Plug & Play, just plug your Roadster into your PC and off you go. There is no requirement for your to even reboot your PC.
- Faster interface - USB as an interface is 10 times faster than parallel ports, 100 times faster than a standard RS 232 serial port. This means that a USB modem interfaces more efficiently than a standard serial connected modem.

SVD - Simultaneous Voice & Data

With the Roadster II 56 USB's Simultaneous Voice and Data (SVD) functionality, you can speak to the person you are sending data to at the same time, over the same telephone line, without having to make an additional call. While playing your favourite games, speak to and hear your competitors' reaction as you blast them away!

Included:

- Roadster II 56 USB modem
- USB cable
- Telephone line cord
- Warranty card and NetComm CD with Symantec WinFax Pro 8 (OEM version)
- Modem drivers and manuals. Drivers included for Windows 95/98 and many third party applications.



\$265

NET028 NetComm Roadster II 56 USB

Note: 56Kbps is a download speed only, 33.6 Kbps is the maximum upload speed. Download speed are subject of telecommunication carrier service.

Banksia WaveSP 56 The fully featured 56,000bps modem!

The Wave SP is the first modem to be awarded a prestigious Australian Design Mark in recognition of design excellence and innovation.

The assessment panel commented that "(the Wave SP) is radically different from its competitors and upholds the highest principles of unitary design".

Banksia's revolutionary new wave SP Fax Modem includes:

- High speed data transmission at 56,000bps (v.90 standard)
- Microsoft Internet Explorer™ for Internet surfing & Web site construction
- Fax transmission at 14,400bps
- Simultaneous voice & data (SVD) transmission
- Full duplex speakerphone (hands free telephone)
- Fully featured smart answerphone
- The best new games
- A radical new shape for optimum audio performance

Buy a Banksia Wave SP 56 modem & get FREE 35mm camera (value \$29)!

5 YEAR WARRANTY

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ISO 9002

ISO 9003

ISO 9004

ISO 9005

ISO 9006

ISO 9007

ISO 9008



\$229

Banksia

AU134 Banksia Wave 33.6 SP Fax Modem

\$199

BAN056 Banksia PC Card 56K

\$259

BAN060 Banksia Combo Card 56K + 10BASE T Ethernet Adaptor

\$339

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Do you need to Get Connected?

3COM U.S. Robotics 56K* Voice Faxmodem

Includes V.90 ITU 56K standard and x2 technology

Experience the Internet like never before! Grab graphics-rich Web pages, e-mail, huge data files, real-time sound and video faster, play intense games, get more done online. Compatible with both the V.90 ITU 56K standard and x2™ technology. Includes a CD-ROM jam-packed with great software for work and play. Visit www.3com.com/56k for a compatible Internet provider near you or call us on 1300 300 003.

Key Benefits:

- Number 1 selling modem in the world
- Brings you great Web sites faster
- Software upgradeable for future enhancements

Stock Code: USR104

\$225

3COM U.S. Robotics 56K* Faxmodem

Includes V.90 ITU 56K standard and x2™ technology

Experience the Internet like never before! Grab Web pages, e-mail, data files, multimedia and games faster, get more done online! Compatible with V.90 standard and x2™ technology.

USR101 56K Faxmodem **\$179**

*Can receive at up to 56 Kbps, send at up to 31.2 Kbps. Due to FCC regulations, receiving speeds limited to 53 Kbps. Actual speeds may vary. Requires compatible phone line and server equipment.

Netcomm CardModem56



Now you can connect to the world even faster with the NetComm CardModem56. The CardModem56 is the ideal modem if you demand the ultimate in speed and portability. You can send and receive faxes at speeds of up to 14,400bps, while data download speeds of up to a scorching 56,000bps are supported (this depends on your telecommunication carrier service).

Features:

- Supports K56flex Technology
- PC Card Data / Fax Modem
- Error Correction and data compression, Distinctive Ring
- Maximum speed of 56,000bps (download only), 33,600bps, V.34,

V.32bis, V.42bis, V.42, MNP2-4, MNP 5, MNP10EC, Plug 'n Play

- Maximum throughput 230,400bps
- Flash Rom upgradeable to V.90 and any other future enhancements via the website - <http://www.netcomm.com.au>.

NET030 Netcomm CardModem56 **\$319**

Netcomm CardModem56 Combo

The Netcomm CardModem56 Combo comprises the Netcomm CardModem56 and Netcomm 10/100 PC Card and is the ideal modem if you demand the ultimate in speed and portability. Data download speeds of up to a scorching 56,000bps are supported (this depends on your telecommunication carrier service). For the mobile professional, the CardModem56 Combo also allows you to connect to an Ethernet LAN. So now you can connect to your office and the world with a single modem.

Features:

- Supports K56flex Technology
- PC Card Data / Fax Modem and Ethernet adapter
- Error Correction and data compression, Distinctive Ring
- Maximum throughput 230,400bps

- Supports Ethernet LAN connection via 10baseT/2
- Flash Rom upgradeable to V.90 and any other future enhancements via the website - <http://www.netcomm.com.au>.

NET031 Netcomm CardModem56 Combo **\$569**

3Com U.S. Robotics 56K External Professional Message Modem

3Com's new range of 56Kbps V.90 standard desktop modems - the 3Com U.S. Robotics 56K V.90 External Professional Message Modem and 3Com U.S. Robotics 56K V.90 External Message Modem - enable users to meet all of their data, voice and message management needs with a single product, guaranteed to provide an enhanced and productive Internet experience.



Features:

- Faster Internet access
- Caller ID
- One-button access to voice messages
- Remote retrieval of voice messages through a dial-up connection
- Built-in high quality speakerphone
- V.80 (video conferencing) capable

- Easier installation and use
- Software upgradeable for future enhancements
- Backed by a Lifetime Limited Warranty
- Valued-added Connections CD-ROM Software

USR105 56K External Professional Message Modem **\$309**

3Com U.S. Robotics 56K External Message Modem

Features:

- Faster Internet access
- Remote retrieval of voice messages through a dial-up connection
- Software upgradeable for future enhancements

- Backed by a Lifetime Limited Warranty
- Valued-added Connections CD-ROM Software
- Easier installation and use

USR106 56K External Message Modem **\$269**

3Com Megahertz Global 56K

3Com Megahertz PC Cards give you the freedom to work when and wherever you need. Just slide one into your notebook and work from almost anywhere - in the office, on the road or in a plane. Connect locally, remotely, or both at the same time with a LAN+modem PC Card. Or get remote connections from wherever you roam with a modem PC Card. They're easy to use, configure, support, and update and guaranteed compatible with your notebook and your network. And because they're 3Com Megahertz PC Cards, you're assured of interoperability.



Try an easily installed, easily configured 3Com Megahertz LAN+56K Modem PC Card and get:

- Reliable, hassle-free, standards-based access and high-speed downloads anytime, anywhere.
- Simultaneous LAN and modem access with Parallel Tasking technology for LAN throughput up to 46 percent faster than PC Cards without it.
- Access anywhere with Direct-Connect Cellular capability.

If you're only after remote connections, try an easy to install 3Com Megahertz 56K Modem PC Card and get:

- Reliable, hassle-free, standards-based access and high-speed downloads anytime, anywhere from any model.
- Direct-Connect Cellular capability and advanced telephony features with cellular-capable models.
- A passport for worldwide access with a global model.
- Faster access working only in Windows, with an exclusively for Windows model.

USR100 3Com Megahertz Global 56K **\$309**

USR107 3Com Megahertz 56K Lan Modem **\$419**

3COM PALM III



Stay organised, wherever you go! The 3COM Palm III is the latest version of the award winning range of personal organisers from 3COM. Weighing in at an amazing 126 grams (approx 160 grams including the batteries) and measuring 12cm by 8cm by 2cm, the Palm III can:

- Store 6000 addresses
- 5 years of appointments
- 1500 to do items
- 1500 memos
- 200 emails

It includes an address book, date book, to do list, memo pad, expense report templates, calculator, security options and some bonus games. Powerful enough to keep you organised. Small enough to fit in your pocket. The amazing Palm III from 3COM.

USR051 **\$679**

Tamzin



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- Two year warranty and Industry approvals

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APC022 APC Back-UPS 650	\$329

Back-UPS Pro

Performance power protection for advanced workstations.

Features

- Instantaneous Backup Power beats blackouts and brownouts
- Lightning and Surge Protection offer maximum hardware protection
- Network-grade Line Conditioning prevents glitches
- Compact Design for efficient use of your workspace
- User Replaceable, Hot-Swappable Batteries lower service costs and increase life span
- Communications Interface automatically preserves data integrity
- 10Base-T network cable surge suppression
- Advanced Warning Diagnostics prevent downtime
- Two year warranty and Industry approvals



APC001 APC Back-UPS Pro 280 PNP	\$309
APC002 APC Back-UPS Pro 420 PNP	\$449
APC003 APC Back-UPS Pro 650 PNP	\$575

Smart-UPS 420 & 620

Performance Power Management for advanced business networks

Features

- Instantaneous Backup Power beats blackouts and brownouts.
- Full-time Surge Suppression and Noise Isolation.
- CellGuard, Intelligent Battery Management.
- Advanced Warning Diagnostics & User replaceable, hot swappable batteries.
- SmartBoost and SmartTrim provide true brownout and overvoltage correction.
- Full C-Tick, UL, and CSA approvals and 2 year warranty.

**Includes
FREE
PowerChute
Plus**



APC025 APC Smart-UPS 420	\$529
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Also Available:	
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Seagate Tape Backup Units



TRAVAN 4 - 8Gb

Features hardware compression and read while write. Backs up to 60Mb per minute*. The unit installs easily, and comes with a 2 year guarantee. The kit also includes Seagate Backup Exec and a free bonus tape to get you started.

SEA140 Internal IDE Kit	\$625
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DAT 12 - 24Gb

Ideal for network backup. This SCSI interface drive features proven technology for premium capacity and performance. Backs up at a rate of 2.2Mb per second*. Comes with a three year warranty.

SEA145 Internal SCSI Kit	\$2675
SEA178 External SCSI Kit	\$3025



AIT 25 - 50Gb

This Advanced Intelligent Tape unit backs up at the rate of 6Mb per second*. Featuring advanced metal evaporated tape (AME) memory in the cassette, this drive gives significantly faster loading and access times. And the self cleaning mechanism ensures high reliability.

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SEA147 External Fast Wide SCSI Drive	\$5570
SEA153 50Gb AIT tape	\$189

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Seagate Backup Exec v3 SEA109	\$125
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D-Link Integrated Networking

In today's communication, networking means connecting people together at work, at home and on the move, creating a world of information at every one's fingertip and affordable to every one. D-Link, a leader in workgroups' communication, provides integrated solutions that guide you on the fast track to the most economical and dependable way of networking. Products range from intuitive adapters for desktop connectivity, to handy network cards for mobile users and high-speed devices for seamless internetworking. Coupled with a global presence, D-Link is committed not only to providing powerful networking tools but also to customer satisfaction with on-target consultation and service throughout five continents.

Ethernet Interface Adapter

- DFE-530TX**
PCI-bus 10/100M Fast Ethernet Network Interface Card
- Intelligent Ethernet/Fast Ethernet Adapter, Auto negotiating 10Base-T/100Base-TX (Nway)
 - Plug and Play support. Low CPU utilisation. 32 Bit high performance.
 - Optional remote boot rom. Certified driver for Netware, SCO Unix, Windows 95 and Windows NT.



\$55

DLK004 DFE-530TX 10/100 PCI Network Card

Internet Server

- DP-602**
2 port Internet ready Server for SOHO Networks
- 1 x 10/100Mbps NWay Ethernet Port, 2 x RS-232 460kbs Com Ports.
 - Supports NAT for single ISP user account, Dial-on-Demand, DHCP, PPP, PAP/CHAP Security.
 - Dual use of Com ports for double bandwidth. Support for Analog modem or BRI ISDN TA.
 - Admin through Windows based program, Web browser and telnet.



\$475

DLK006 DP-602 Internet Server

10/100Mbps NWay Dual Speed Hubs

- DFE-908X/N**
8-port 10/100Mbps Dual Speed Hub with Switching. Stackable
- Unmanaged 8 port Nway Dual Speed Hub. Stackable up to 5 units or 40 ports.
 - 8 x RJ45 ports to support CAT3,4,5 for 10Mbit connection, CAT5 for 100Mbit connection.
 - Internal switch module to connect 10 and 100Mbit backplanes.



\$695

DLK011 DFE-908X/N 8-port 10/100Mbps Hub

DFE-916X

- 16-port 10/100Mbps Dual Speed Hub with Switching. Stackable
- Unmanaged 16 port Nway Dual Speed Hub. Stackable up to 5 units or 80 ports.
 - 16 x RJ45 ports to support CAT3,4,5 for 10Mbit connection, CAT5 for 100Mbit connection.
 - Includes switch module to connect 10 and 100Mbit backplanes. Can be managed by DFE-2624IX



\$1345

DLK012 DFE-916X/N 16-port 10/100Mbps Hub

Ethernet PCMCIA DMF-560TX

- 56K Fax Modem / Fast Ethernet 10/100 dual-speed Nway PCMCIA Card with RJ-45 connectors
- PCMCIA v2.x, PC Card 95 and JEIDA v4.x Type II support, Full Plug and Play, Full duplex supported.

- Auto-detects IRQ & I/O addresses, Netware, SCO Unix, Windows 95 and Windows NT Compatible
- C-Tick + ACA approval

DLK005 DMF-560TX 56K PCMCIA **\$529**

Network Products - Made to Measure

Networking is part of our everyday lives, and at International Software Warehouse, we have a wide range of products to suit the Small to Medium Enterprise market all the way up to the Corporate office with over 100 workstations. As network demands have grown, users and IT managers have identified the ever-increasing need for stabilising their network environments. That's why we carry a full range of quality products from Network Interface Cards to Switches and Print Servers. This is just a sample of some of our exciting range!

HEWLETT PACKARD HP Hubs & Switches at-a-glance

Desktop Value Line Hubs	Desktop Feature Line Hubs & Switches	Interconnect Switches
Excellent value and worry-free operation for any size network	Modular designs for easy upgrades and expansion.	High Performance with affordability and simplicity.
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HP AdvanceStack 100Base-T Hub-12TX	HP ProCurve Switch 212M & 224M	HP AdvanceStack Switch 2000
HP ProCurve 10Base-T Hub 12 and Hub 24	HP AdvanceStack 10BT Switching Hubs	HP AdvanceStack Switch 800T

Adaptors

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3Com More connected.

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3CO033 ETHERLINK XL PCI 10BT	\$119

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The cover disc: apcmag.cd

The disc has two main aims:

- To provide fast, easy access to the files and resources we talk about in APC and to save you download time and money.
- To make it easy for our readers to get on the Internet so they can use our new interactive Web site.

The kit contains browsers, file-transfer programs, mail and newsreaders and much more for each of the major operating systems. To make it as easy as possible for readers to get online, we've also included reader offers and a sign-up kit.

apcmag.cd aims to complement both the magazine and APC's Web site. The concept is simple: when you read about a program in the magazine, such as a piece of software from a Shareware column, you need only insert the CD, browse it with your favourite WWW browser, and download the file directly from the CD. Each piece of software includes instructions on whether you will need to unzip the file before installing it; most also include Readme files.

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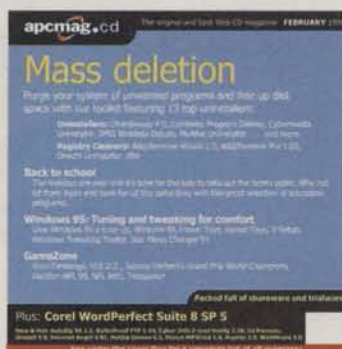
special software to access the disc, other than a standard browser, and it will work on most common platforms.

We've provided the software on the CD for the convenience of our readers — to save you the effort of locating and downloading the material yourself.

As with any site on the Web, the software on the CD is provided as is, in the hope that it will be useful to you, and without any warranty, express or implied. If you're interested in a product or service we review or refer to, contact the company that distributes or supports it for more information, or to discuss any problems you may have with it.

You should carefully read the licencing agreements and honour any evaluation or shareware terms specified, read all instructions and Readme files, and virus-check every program before use. We check the CD with the latest available tools each month, but new viruses appear every week.

While we've taken every care to ensure that the software provided is useful and that it works, we cannot accept responsibility or liability for any of the products included.



How to run the CD

Windows 95, 98 and NT users

The CD uses an AutoRun feature for Windows 95, 98 and NT systems. Just insert apcmag.cd and your browser will automatically load with the apcmag.cd front page.

Note: First-time users will be prompted by a browser set-up program (SETUP32.EXE) which will allow them to install a browser or update your current browser. This program is only loaded once, and subsequent use of the CD will automatically start your installed browser.

Win 3.x, OS/2, Mac, Linux

Simply launch your favourite browser and load the file DEFAULT.HTM in the root directory of the CD.

If you don't have a browser, run the file INSTALL.BAT in the root directory of the CD.

The CD has been tested using Netscape Navigator 3.0 and 4.0, and MS Internet Explorer 3.0 and 4.0.

Conditions of entry

Instructions on 'How to Enter' form part of the Conditions of Entry of all competitions in APC February. Entry is free and open to all residents of Australia other than employees of ACP Publishing Pty Ltd (ACN 053 273 546), suppliers of competition prizes, their families and associated agencies.

The contests close last mail February 18. Enter according to the instructions supplied with the individual competition. The contest will be judged by a panel appointed by ACP Publishing Pty Ltd on February 19, 1999. The judges' decision in relation to any aspect of the competition is final and binding on every person who enters. No correspondence will be entered into. Chance plays no part in determining the winner. No responsibility is accepted for late, lost or misdirected entries. All entries become the property of ACP Publishing Pty Limited, the promoter, 54 Park Street, Sydney, NSW 1028.

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Contact: Natalie Richardson

Phone: (02) 9288 9123

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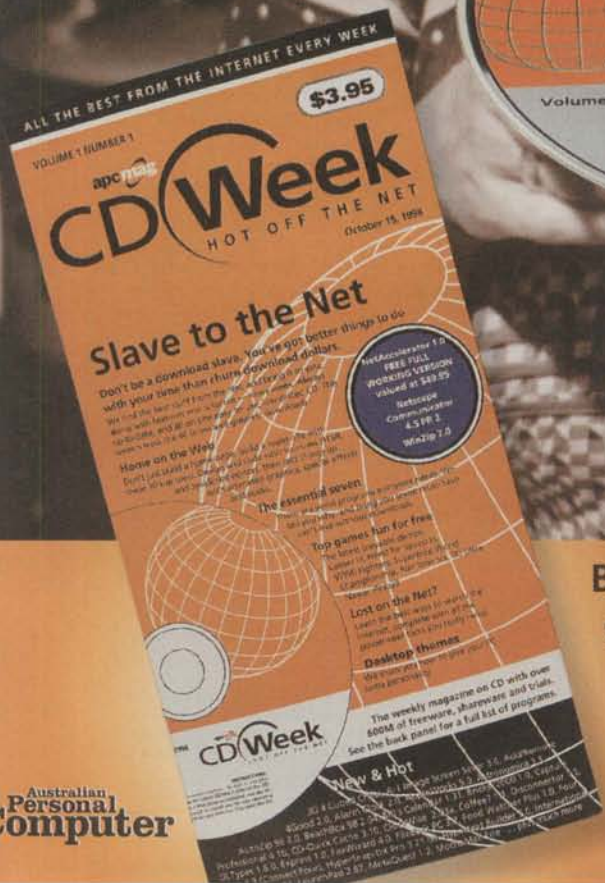
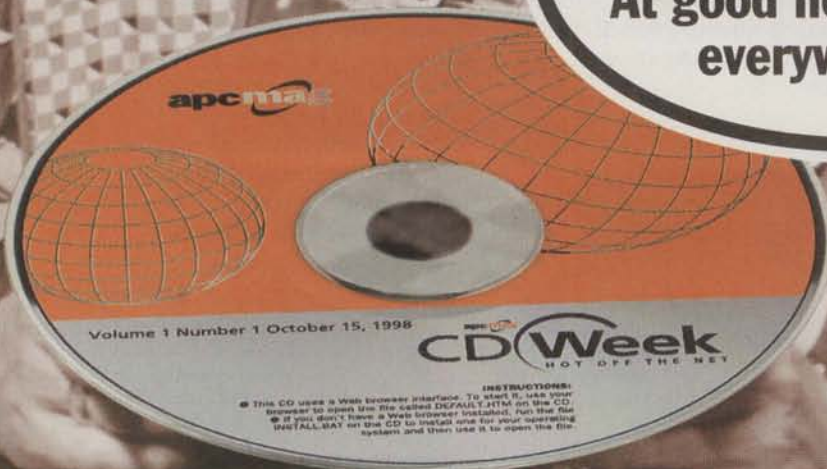
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If you're frustrated by the number of really bad Visual Basic books, our reviews will help you sift through the heap. **By Travis Simon**

Visual Basic 6

Visual Basic 6 Programming Blue Book, Visual Basic 6 Black Book

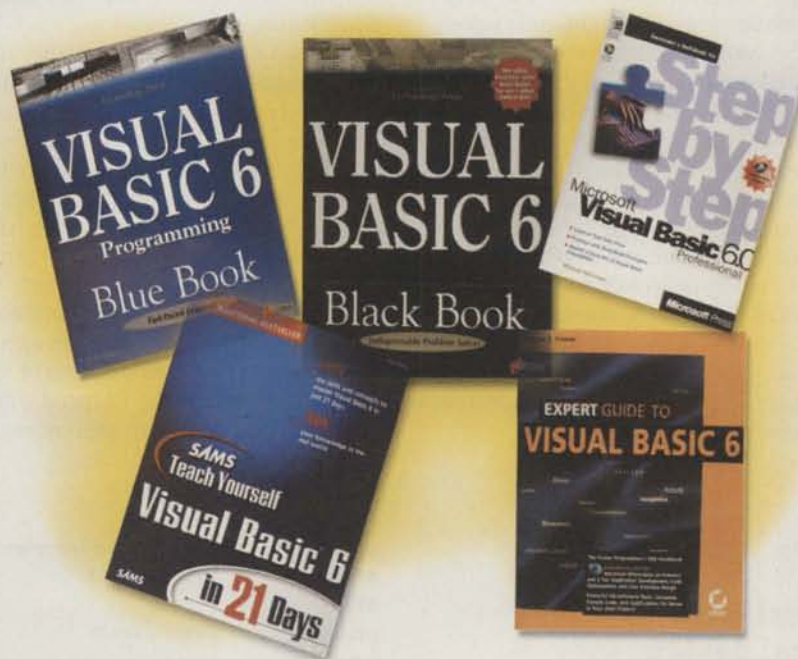
Coriolis Technology Press publishes two Visual Basic titles — one from its Blue Book line and one from its Black Book line. Each line has a separate aim. Blue Books aim to be fast-paced introductions to subjects, while Black Books set out to be reference books. As would be expected, the Blue Book series is directed more at newcomers, while the Black Book aims to provide quick solutions to programmers already familiar with a topic.

Peter Aitken, author of *Visual Basic 6 Programming Blue Book*, has an amazing, instinctual talent for pacing his teachings. Throughout the *Blue Book* he stays a half-step ahead of the reader; challenging and enticing them to keep reading.

For example, early in the work he implements a Reverse Polish Notation (RPN) calculator. There is nothing particularly revolutionary about the program, but the concept of a data stack is likely to be entirely new and conceptually exciting to new programmers. This example is typical of Aitken's writing: as the reader progresses through the book, they are likely to find their mind swimming in the possibilities programming opens up. If you are a newcomer to Visual Basic the *Blue Book* is the one to buy.

Coriolis' *Visual Basic 6 Black Book* is the antithesis of the *Blue Book*. It is structured in a series of quick 'how do I . . . ?' questions and answers. It is intended as a quick refresher for experienced programmers. In this capacity it is excellent, but it is far too cumbersome for newcomers.

Although the concept of two titles from similar ranges on the same topic might seem like overkill, Coriolis has managed to clearly define separate target audiences, and these two books hit the mark perfectly.



Visual Basic 6 Programming Blue Book

■ Author	Peter Aitken
■ Publisher	Coriolis Technology Press
■ Distributor	Woodslane
■ Phone	(02) 9970 5111
■ Price	\$110
■ ISBN	1-57610-281-5
■ Rating	★★★★☆

Visual Basic 6 Black Book

■ Author	Steven Holzner
■ Publisher	Coriolis Technology Press
■ Distributor	Woodslane
■ Phone	(02) 9970 5111
■ Price	\$110
■ ISBN	1-57610-283-1
■ Rating	★★★★

Microsoft Visual Basic 6.0 Step by Step

It is always surprising when a programming book's title reflects so accurately the contents of the book itself. *Microsoft Visual Basic 6.0 Professional Step by Step* is exactly that — a step-by-step guide to learning

Visual Basic. It moves a little more slowly than some books, and is definitely aimed at newcomers to programming.

One of the most notable aspects of *Step by Step* is its presentation — it is immaculately designed and presented. For example, at the beginning of the book there is a road map guide to what the book will cover. However, instead of simply giving a text-based listing of each chapter's contents, the 'QuickLook Guide' presents a series of attractive screenshots illustrating the concepts of each section. The book's design also employs duotone text,

Guide to ratings

★	Colin Dunstan: Bombs badly
★★	Kerri-Anne Kennerly: Doesn't quite hit target audience
★★★	Paul and Annita: Equal split
★★★★	Warne and Waugh: A pretty good bet
★★★★★	Jason Gillespie: Bound to bowl you over

different fonts and plenty of illustrations to break up the text. In purely aesthetic terms, which should not be underrated in your enjoyment of a book, *Step by Step* is very impressive.

The other essential ingredient — the content — is not as impressive, which is not to say it is in any way poor, but simply that this is not a compelling read. The pace is slow and deliberate, often bordering on the basic. *Step by Step* also does not cover the language in the same depth as the other titles reviewed here. The larger fonts, slower pace and numerous screenshots prevent the author from digging as deeply as some readers might wish.

Experienced developers will find *Step by Step* moves a little too slowly for their liking. However, newcomers who have some trepidation about learning to program will find this title a gentle introduction to the language, and one which avoids the condescending approach taken by many authors of Visual Basic titles.

■ **Author** Michael Halvorson
 ■ **Publisher** Microsoft Press
 ■ **Distributor** McGills
 ■ **Phone** (03) 9602 5566
 ■ **Price** \$89.95
 ■ **ISBN** 1-57231-809-0
 ■ **Rating** ★★★

Expert Guide to Visual Basic 6

If you're a programmer with Visual Basic experience, finding a book that is both challenging and rewarding can be difficult. Visual Basic books rarely go into much detail, and are often aimed at the lowest common denominator. However, the *Expert Guide to Visual Basic 6* stands out in the crowd as an excellent title for experienced programmers who want to go to the next level.

The range of topics is wide, although author Wayne Freeze is careful to provide enough information on each topic so that programmers without experience in any one area will quickly be able to get up to speed. However, the beauty of the *Expert Guide* is that it does not get bogged down in long, tiresome explanations. Freeze manages to find just the right balance between providing too much and too little information. Further, the code examples are interesting, but not so intricate that the original point is lost.

Among some of the more unique topics covered are client/server programming, dynamically created forms, screensavers, accessing the Registry and using Visual Basic script. Of all the topics covered, the best chapter is 'Optimizing Your Application', where Freeze shares some excellent tips gained from his extensive Visual Basic experience.

The *Expert Guide To Visual Basic 6* is not a book for beginners, but it is an excellent guide for users of older versions of Visual Basic looking to get up to speed with the latest in Visual Basic programming.

■ **Author** Wayne Freeze
 ■ **Publisher** Sybex
 ■ **Distributor** Addison Wesley Longman
 ■ **Phone** (02) 9428 8000
 ■ **Price** \$109.95
 ■ **ISBN** 0-7821-2349-X
 ■ **Rating** ★★★★★

Sams Teach Yourself Visual Basic 6 in 21 Days

Sams publishing has a winning format in *Teach Yourself Visual Basic 6 in 21 days*. In the past, we have reviewed many of Sams books, and they are generally excellent introductory titles.

On the surface, it looks like any other title in the series. Learning is divided by week and each week has a 'Week At a Glance' section. Each chapter concludes with the familiar Do/Don't boxes and a quiz. However, the book does not read quite as well as some of the others.

The main problem with this *Teach Yourself* is that there is too much repetition. For example, the section on the Dialog Box control introduces the topic, explains what the common dialog boxes are, and then explains each individual dialog box. The problem is that the dialog boxes are explained in each of the sections, and essentially the same information is repeated three times. While it's true that it ensures the reader understands the material, this approach kills any forward momentum the book might have otherwise built up.

Equally unexciting, the code examples are the most basic possible and are also often quite short.

Like the rest of the *Teach Yourself* books, there is little chance of actually finishing it in 21 days, especially since this title misses the deadline and extends to 23 days! Unfortunately, unlike many of the other books in the series, the text provides little incentive to try to finish the book anyway.

■ **Author** Greg Perry
 ■ **Publisher** Sams Publishing
 ■ **Distributor** Prentice Hall
 ■ **Phone** (02) 9454 2222
 ■ **Price** \$69.95
 ■ **ISBN** 0-672-31310-3
 ■ **Rating** ★★★

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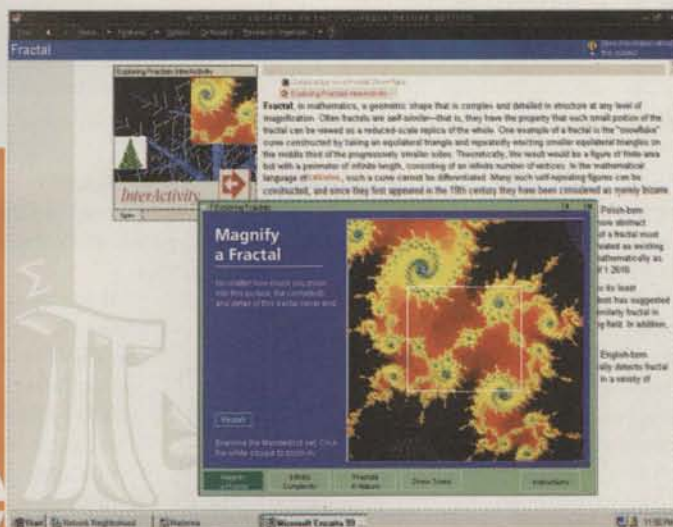
Title	Author	Publisher	Distributor	Phone	Price	ISBN
Visual Basic 6 Unleashed	Rob Thayer	Sams	Prentice Hall	(02) 9454 2200	\$109.95	0-6723-1309-X
Using Visual Basic 6	Bob Reselman, et al	Que	Prentice Hall	(02) 9454 2200	\$59.95	0-7897-1633-X
Sams Teach Yourself More Visual Basic 6 in 21 Days	Greg Perry	Sams	Prentice Hall	(02) 9454 2200	\$69.95	0-6723-1307-3
Mastering Visual Basic 6	Evangelos Petroustos	Sybex	Addison Wesley Longman	(02) 9428 8000	\$109.95	0-7821-2272-8
Visual Basic 6 in Plain English	Brian Overland	IDG Books Worldwide	Woodslane	(02) 9970 5111	\$54.95	0-7645-7007-2
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1. SMH, "Icon", Page 5, 31 October 1998. MIC23611/R/BRACES/PCU

Perspective: From the horse's mouth

Bill Gates Speaks

The title of this compact, hardcover book may be familiar to some; Janet Lowe is also the author of *Warren Buffett Speaks*, *Jack Welch Speaks* and *Oprah Winfrey Speaks*. Lowe provides an insight into Bill Gates by drawing on quotes from his speeches, articles, interviews, media coverage and essays. These are woven into an easy-to-read biography.

Readers should not expect a detailed, extensively researched profile of Gates. The style of the book is somewhat fragmented, resulting in just 200 pages of short quotes and Lowe's own sometimes simplistic observations.

It begins by focusing on the young, super-active Gates, who taught himself computer programming at the tender age of 13. Perhaps not extraordinary for the 1990s, but certainly unusual in the late 1960s. It progresses through his early successes with fellow programmers Steve Ballmer and Paul Allen, before covering the rise and rise of Microsoft. The book concludes with a brief glimpse of Gates' personal life — his home, his wife (apparently, his idea of relaxation is to race his wife in assembling identical jigsaw puzzles), his daughter, his preferred charities, and his hopes for the future.

Bill Gates Speaks can be easily opened at any page, or flipped through from section to section. It offers something for everyone, mixing coverage of Gates' management style and Microsoft's business model with lightweight anecdotes, such as an interview with the Gates' 92-year-old neighbour, Audrey House, who speaks of the "fine man" who sends a crew to cut her lawns on Saturdays.

Given its style and the extensive use of quotes as the source material, this book could have equally been in coffee table format. However, to be successful, Lowe would also have needed to include photographs, which were conspicuous by their absence.

This book is a relatively objective disclosure of the man Lowe says is "admired, detested, glorified and vilified". She covers his generous donations to causes throughout the world, but also addresses Microsoft's chequered past with

deadlines, its late awakening to the growth of the Internet, and the US Senate's inquiry into the company's business practices.

If you want to understand what drives Bill Gates, spend your money on *The Road Ahead*, a book Gates co-authored with Nathan Myhrvold and Peter Rinearson. If you want some Gates trivia, then *Bill Gates Speaks* will provide you with plenty of ammunition. This reviewer's two favourites were the 24 bathrooms and six kitchens in the main house, and the 100-car underground facility with heated floors.

The Gates family must be clean people who eat well and like to keep warm.
Cathie Kennedy



■ Author	Janet Lowe
■ Publisher	John Wiley & Sons
■ Distributor	Jacaranda Wiley
■ Phone	(02) 9805 1100
■ Price	\$29.95
■ ISBN	0-471-29353-9
■ Rating	★★★

The Machine in Me

Subtitled "An anthropologist among computer engineers", *The Machine in Me* purports to take an anthropological approach to the way computers and humans interact.

Anthropology is, according to *The Macquarie Dictionary*, a science dealing with the "origin, development . . . and varieties of humanity", including the cultural development, customs and beliefs of humankind. Like sociology, anthropology is a 'soft science' and as such it is often scorned by those dealing with 'pure' sciences as little more than barely supportable anecdotes tied together with high-sounding academic language.

The Machine in Me starts off in exactly this manner, with highfalutin' language interspersed with Gary Lee Downey's personal observations. It's hard to fault Downey's application, his fieldwork, or his ultimate goal — to show how technology influences the lives of those who work closely with it, and how those who work

with technology influence the technology itself. Instead, the fault lies with the 'latency' period that has elapsed between Downey's work in the mid-to-late '80s through to about 1990, and its publication this year.

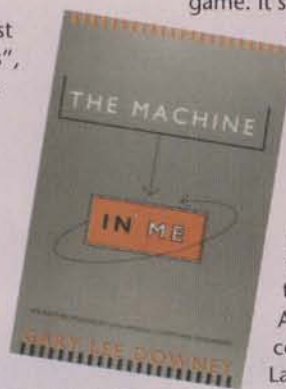
In a world where technology cycles can be measured in weeks and months, *The Machine in Me* reads like a set of lecture notes transmitted forward through time. Companies few people have ever heard of — including VAX-modifier ComputerVision and pioneer workstation vendor Apollo — feature prominently, as do the long purchase cycles and technology challenges that were associated with using such arcane equipment.

Fortunately, when Downey records his conversations with the people who actually used these machines, he loses the 'academese' in favour of almost straight reportage. But as an academic text striving to be relevant to a broader body of readers, it doesn't really work.

Another problem is the book's case-study focus on the CAD/CAM industry. During the early '80s, CAD/CAM was positioned as the saviour of US industry, enabling it to beat Japan Inc in the product development and manufacturing game. It's never really become the be-all and end-all it was predicted to be, which Downey partly explains in terms of process. But he misses the fact that US economic expansion in the '80s, and the decline in CAD/CAM's relative importance were driven by two factors: US financial transparency (as compared to Asian and European competitors), and the Moore's Law technological leapfrog that has allowed computers to become design tools at very modest costs.

The Machine in Me is hard to recommend for a number of reasons, but mostly because it makes the fatal mistake of not being a very interesting read.

Josh Gliddon



■ Author	Gary Lee Downey
■ Publisher	Routledge
■ Distributor	Jacaranda Wiley
■ Phone	(02) 9805 1100
■ Price	\$49.95
■ ISBN	0-415-92022-1
■ Rating	★★

Party with B1 and B2, delve into 'Star Wars' minutiae, or build your family tree.

Pyjama party

Bananas in Pyjamas: It's Party Time

The Bananas in Pyjamas are back in a new CD-ROM, *It's Party Time*. Aimed at the television series' fans, aged between two and six, there is lots of fun, music and action to help introduce children to computers.

The 3D animation is terrific, accurately capturing these well-loved characters, and as the child follows B1, B2 and the Teddies through various locations, the humour of the series comes through. The voices and theme song are identical to those in the television series, and although there is much repetition in what is said, this is probably not a problem for this age group. However, the party backdrops lack sophistication and have limited opportunity for interaction compared with other similar products.

There are 10 main games to play, ranging from the usual simple mazes and memory games to creating your own pizza, mask or piece of music. Hand-eye coordination —



an essential skill for small children to master — is cleverly encouraged in the fun game of Chase the Teddies. Other skills which can be practised include logical reasoning when trying to find the hidden top; spatial intelligence when filling the shelves; and sequencing using toy blocks. None of these activities are too demanding and all have very limited skill-level adjustment, although they are completely self-correcting.

There are several opportunities for children to join in dancing, which is a good idea for those who can't sit still for long! Other activities to get children in

party mood are playing statues, bouncing balloons, playing hoopla and dropping a ball in a clown's mouth.

An extra bonus is the paint-and-print Fun Pack.

This is a quality product for preschoolers, and uses familiar characters to build basic skills. It certainly has charm, but its relative simplicity means it may have a limited life: many children will master it fairly quickly.

Catherine Howard

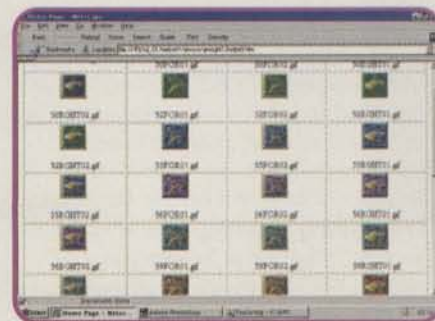
■ Publisher	Dataworks
■ Distributor	Dataworks
■ Phone	(03) 9764 8344
■ Price	\$49.95
■ Requires	Windows 95/98, 16M RAM, 4x CD-ROM drive, SVGA, mouse and soundcard. PowerPC-compatible
■ Rating	★★★★

IMSI MasterClips WebArt

The concept of most clip art collections is to save time; instead of searching for a suitable image, or creating it from scratch, clip art allows you to speed up the creation process with a quick solution. Nowhere is this more true than with Web sites. A good, consistent and clean design can make the difference between a quick perusal of your site and a long-term visitor.

IMSI MasterClips WebArt is certainly no slouch when it comes to providing Web-ready content. All in all, the package boasts 100,000 images and sound clips specifically designed for Web use. While some of the images are a little large as regular files — there are 100,000 to choose from — most Web designers should find a suitable image or two to fit their needs. With the Web in mind, the package includes 40 sets of common image needs (buttons, backgrounds) organised around central themes. So whether you're setting out an alien conspiracy site, or planning to sell tomatoes over the Internet, there should be something to meet your requirements.

The collected images and sounds are impressive in their own right, but the package's usefulness is severely compromised by



the lack of a search feature. The images are previewed as HTML pages, and while they are categorised, there's no way to search on keywords. The accompanying booklet has a selection of the images, but these are mainly in the buttons and backgrounds category — usually you choose an entire category, rather than picking individual buttons from different categories. Even worse is the CD with all the sound files, it simply gives instructions on how to listen to the files with Windows Explorer — and that's all!

Overall, IMSI MasterClips WebArt has a large amount of good content, badly let down by its lack of searching facilities.

Alex Kidman

■ Publisher	IMSI
■ Distributor	IMSI Australia
■ Phone	(02) 9319 7533
■ Price	\$99.95
■ Requires	486, 8M RAM, 2M hard disk space, 2x CD-ROM drive
■ Rating	★★★

Star Wars: Behind the Magic

In the run-up to the release of 'The Phantom Menace' we can expect to see a lot of 'Star Wars' merchandise — some good, some awful. 'Star Wars' is big money. Thankfully, *Star Wars: Behind the Magic* (SW:BTM) is one fine product.

Billed as a 'Star Wars' encyclopaedia, there isn't a single area where SW:BTM fails to deliver, from the opening intro to the detailed specifications on just about any aspect of the 'Star Wars' universe you might care to mention. Sections are organised in a logical and consistent manner, and the searchable glossary is fast and

Interactive News

With the increasing capabilities of multimedia computers, it's no surprise to witness the growing trend for multipurpose cards. STB has joined the bandwagon with the news that it will be releasing what it's calling the 'next-generation' TV-tuner board — the 'Desktop VCR'. The unit will offer a single-device PCI solution, with a television and FM receiver, video in/out and frame capture, along with video-editing software. To top it all off, the Desktop VCR will also encode MPEG-2 for video editing, as well as decode MPEG-2 for video playback or for watching DVD movies. The card should be released in the US in the near future, and will hopefully be

available locally soon afterwards.

The market for digital cameras has become hotly contested over the past few years, with consumers reaping the benefits of the competition: increased capabilities and features. Sanyo has jumped into a pre-eminent position with the release of the VPC-X350, a unit capable of storing up to 60 images (in 1,024 by 768 resolution), or up to 60 seconds of video images with sound, which can also record up to 40 sequential images. Despite all these features, amazingly, the unit weighs under 200g! This is made possible by Sanyo's proprietary 'Super One Chip LSI' image-processing chip, rather than the more common three-chip

solution. Not only is it small, it's also very powerful, and is capable of processing images in around 1.5 seconds — much faster than the standard for other Digicams.

At present, the only possible way to get full-screen, full-motion MPEG-2 video in real time is if you're lucky enough to have a video card with hardware MPEG encoding, or a standalone MPEG card. Xing Technology, has announced it will be offering a similar solution for video files. The XingMPEG Encoder 2.1 was initially shown at COMDEX last year, and should allow full-screen, full-motion video on a PII 300 with 64M of RAM.

Gareth Jones

responsive. SW:BTM is a joy simply for the multimedia resources it contains, everything from unused footage from the 'Star Wars' trilogy special editions, to the details behind the noise a TIE fighter engine makes (it's a cross between a wet tyre at high speed and an elephant's roar).

Navigating SW:BTM is simple and intelligent, using a browser-style searching bar at the base of the screen, along with a 'map' which provides you with 'six degrees of Star Wars', linking characters from virtually every medium 'Star Wars' has appeared in, movies, games or comic books.

LucasArts has a reputation for adding a little bit more to its software, and in the case of SW:BTM it is in the addition of extra, non-encyclopaedia material. Ever wanted to see Princess Leia in a fashion parade? Or see what the effects the Death Star laser would have on a lowly stormtrooper? Both wishes can be fulfilled with some impressive animated sequences. These extend to animations that play when certain sections of the title are accessed, and an interactive walkthrough of the Millennium Falcon.

Perhaps the only quibble that could be raised about SW:BTM is that the trivia

questions are linked to individual entries and thus cannot be accessed as a whole.

Alex Kidman

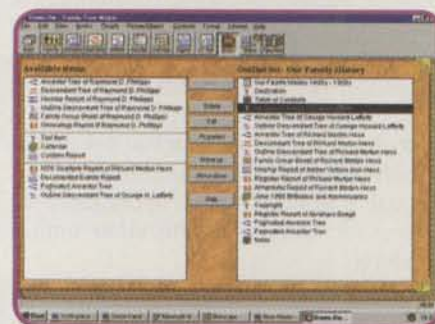
Publisher	LucasArts
Distributor	Metro
Phone	(03) 9329 2999
Price	\$49.95
Requires	Pentium 133, 16M RAM, 4x CD-ROM drive, DirectX 6.0 (supplied)
Rating	★★★★☆

Family Tree Maker Version 4

This two-CD set is the budget version of Family Tree Maker (FTM); it's also available in four-CD and 10-CD versions with added features. But unless you're researching an epic historical novel and your ancestors came from the US, the budget version is probably all you'll need.

In the US, this program sells well and has received top awards from several leading computer magazines. Surprisingly, it translates quite well to the Australian market, as compiling lists of births, deaths and marriages doesn't usually involve things like "zip codes" or baseball. What it does involve is a hell of a lot of research.

The Internet's resources and the expanded facilities of major libraries have made genealogy a popular hobby in the 1990s, but you have to make a serious time commitment. FTM doesn't do much to solve this. Rather, it assists in the storage, correlation and publication of the information you gather. Despite uncomplicated presentation and even a few text-



based areas, the program is easy to get to grips with and offers a good range of views (ancestors, descendants, kinship, all in standard tree or fan formats, and even the opportunity to create detailed biographical information if you uncover it).

FTM's data format is unlikely to be supported by non-genealogical databases, meaning you or your relatives may find it a little difficult to transfer information to superior applications later. On the other hand, all data for a tree is stored in a single 'FTW' file that can be saved in Genealogical Data Communication (GEDCOM) format for backward compatibility.

There's nothing fancy about this software, but it gets the job done.

Simon Vandore

Publisher	Brøderbund
Distributor	Dataflow
Phone	(02) 9417 9700
Price	\$49.95
Requires	Windows 3.1 or later, 386 or better, 8M to 16M RAM, 16M hard-disk space, 2x CD-ROM drive
Rating	★★★



Get a life

Half-Life

This is a work of art. It may be another one of those Quake/Unreal/Shogo-type games (a first-person shooter), but it's a far more immersive experience. The believability level is so high it's almost traumatic.

For a start, the computer-controlled enemy soldiers scared me. The first time I encountered one, he was running up some stairs. We exchanged shots while he ducked for cover. I chased him down the stairs, but he turned and fired, wounding me, so I darted around a corner. While I schemed, something bounced off the wall and rattled to a stop at my feet, then blew me into pieces — a hand grenade.

With this in mind, I played at the highest difficulty setting; these guys were so close to being human that I wanted to see if I could survive when they were given free rein. Believe me, taking on fortified gun emplacements crawling with these troops requires a whole new skill, especially when ammunition is at a premium. And so far I've only told you about the human element... most of Half-Life involves aliens.

Another striking thing about this game is its lack of intro movies, cut-scenes or level changes. There's just the game, and a hilarious 'training course'. Cut-scenes are replaced by actual events that occur around your character during play, while maps are loaded in small pieces. What might have been the intro movie — a train ride to work — becomes the first map.

Picking faults with Half-Life is almost disrespectful, but a bit more variety in the characters would help. Where Unreal has various sub-classes of Skaarj, and its humans have differing physical characteristics, Half-Life's cast of personalities is mildly repetitive. But the whole way every-

thing works together is so brilliant that my only other complaint is that Half-Life left me shell-shocked. It's not for the young 'uns, and it's certainly not to be messed with lightly. I lost a day and a half the first time I played, and I'm putting off the inevitability of a second go!

Simon Vandore

■ Distributor	Dataflow
■ Phone	(02) 9417 9700
■ Online	http://www.sierrastudios.com/games/half-life/
■ Price	\$89.95
■ Requires	Pentium 133, 24M RAM, 2x CD-ROM drive
■ Classification	MA 15+
■ Rating	★★★★★

Madden NFL 99

Though I loved Madden NFL 99, I do have to say that if you're not a fan of American football, you probably won't get much out of it. You don't need to know the difference between a playaction passing and a quarterback sneak, but you do need a basic understanding of American football and how it is played. If you do like the game, but don't know a great deal about it, there is an Arcade mode which is easier to play.

American football is a thinking person's game as there are many strategies and hundreds of plays the players must memorise. With all the stops involved, it's not uncommon for a one-hour game to take three hours to complete. However, to its credit, Madden NFL 99 does not maintain this realism, and the gameplay is fairly free-flowing.

All the other aspects of the game are very realistic. From the current rosters and statistics to the different stadiums, EA Sports has done well to incorporate many elements of the 1998 to 1999 season into its game.

The graphics are exceptional, which I have come to expect from all of EA Sports' titles, and the gameplay is better than expected. Selecting plays is performed through a series of graphical menus and once you become familiar with the plays for your team, the play-selection process will become easier and



almost automatic. Punting and place-kicking is performed with easy-to-use power and direction meters.

With John Madden's face and name plastered all over the game, it is no surprise that he's head commentator. The commentators' American drawl adds a realistic touch, but I was a little disappointed with the repetitiveness of the commentary.

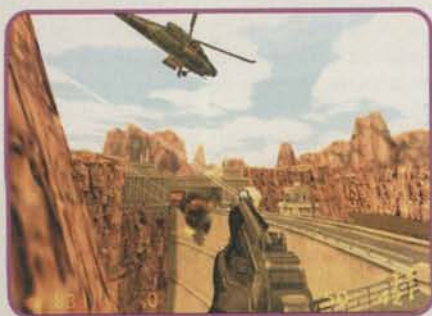
Madden also provides many educational insights, not only through his in-game comments but also through the extra disc titled Madden 101. On this disc, you will find numerous explanations of the different plays and formations involved with the game, as well as some insights into the history and future of each team.

Kieran McNamee

■ Distributor	Electronic Arts
■ Phone	(02) 9955 7744
■ Online	http://www.easports.com/
■ Price	\$49.95
■ Requires	Windows 95, Pentium 200, 32M RAM, 8x CD-ROM drive, 3D graphics card
■ Classification	G
■ Rating	★★★★

H.E.D.Z.

It is easy to become jaded when the latest game to hit the shelves is yet another first-person shooter or real-time strategy title. It's refreshing to see a game like H.E.D.Z. (Head Extreme Destruction Zone) come along. It has more in common with console platform games than any of the traditional PC titles, and is a reminder of a time when computer games did not take themselves too seriously.





The basic premise is that you are an alien engaged in gladiatorial combat. The weapons that you can use, and the skills that you employ, depend on which 'head' you wear. There are over 200 heads available, each one originally collected from a hapless earthling. Some heads give you special weapons — a Molotov cocktail, a homing football, or maybe a heat-seeking sheep (this is definitely not your average Quake clone). Other heads give you certain skills, such as power jumping or extra speed.

Each opponent also wears a particular head, and by defeating them you get to add their head to your collection. The trick is to gather as many different heads as possible, and strategically use them to defeat your opponents and navigate the levels. Secret areas and hidden bonuses are also featured.

As you'd expect from what is essentially a platform game, the controls are straightforward. However, the default key settings are awkward, and you'll need to change them to succeed. The action is viewed from above and slightly behind your character, depicted according to the head being used at the time.

This is definitely a game for those equipped with a 3D card. A software-rendered mode is available, but the slow frame rate makes it virtually unplayable. In addition, the game will only run in Windows' High Color (16-bit) mode, which is an odd limitation. And despite downloading the latest patch, we experienced a number of minor bugs, including an occasional reluctance to boot up.

Nevertheless, this is an original game that is both engaging and humorous, and can be warmly recommended to anyone seeking relief from relentless gore-fests or brain-bending strategy games.

Jon Gill

■ **Distributor** Dataflow
 ■ **Phone** (02) 9417 9700
 ■ **Online** <http://www.hedz.com/>
 ■ **Price** \$79.95

■ **Requires** Windows 95, Pentium 166, 16M RAM, 4x CD-ROM drive, DirectX 5.2 or higher

■ **Classification** G

■ **Rating** ★★★

Trespasser

At last, an FPS game that isn't just mindless aggression with no plot! Trespasser differs from the normal 'find a big gun and make a big mess' model by playing on the other engaging aspect of first-person shooters — the concept of survival.

Trespasser is a game licensed around the lukewarm sequel to 'Jurassic Park', 'The Lost World'. In Trespasser, you are stranded on a remote tropical island a number of years after the conclusion of the 'The Lost World'. At first disorientated, you explore the island and find ruined buildings and toppled cars. You then hear a low rumble, and the earth starts shaking as the denizens of this tropical isle take a look at you. The emphasis is strictly on survival and escape, rather than mindlessly blowing away the prehistoric inhabitants. As such, the hook is different — if you allow yourself explore and be drawn into the large and realistic levels, there's an awful lot to find.

The graphics in Trespasser are simply stunning, providing you have a PC capable of running it — a 3D accelerator is a must. The ruined surroundings are depicted well, with a little fogging to cover the redraw rate, and the dinosaurs themselves are a joy to behold. If you weren't afraid of raptors before, you soon will be. The package is nicely complemented by a very low-key soundtrack, which concentrates on giving you clues to your surroundings, and a small amount of event-driven music. This heightens the effect of paranoia — as soon as the music starts up, or John Hammond starts describing a new type of dinosaur, you know you're in trouble.

The control method is a novel one, and



a little hard to get to grips with initially. The left mouse button controls your arm, which reaches out to grab the wide variety of interactive objects, from guns to stones to barrels, while the right mouse button does the grabbing. To nitpick, some slopes can only be climbed where the programmers want you to go, which can be annoying, and (as your character is female) when looking directly down three quarters of the view is obscured by a gratuitous cleavage shot. Didn't the programmers have anything better to do?

Alex Kidman

■ **Distributor** Electronic Arts
 ■ **Phone** (02) 9955 7744
 ■ **Online** <http://www.trespasser.com/>
 ■ **Price** \$69.95
 ■ **Requires** Pentium 166, 32M RAM, 120M hard disk space, 4x CD-ROM drive
 ■ **Classification** M 15+
 ■ **Rating** ★★★

Fallout 2

Fallout 1 was probably the most innovative RPG to be released in the last few years. Featuring some great technology, a lot of character and a wasteland milieu that separated it from the usual Dungeons and Dragons fare, the big problem with Fallout 1 was that it was way too short.

Fallout 2 is more of the same, and that ain't bad. It is much longer and adds so much more — not in terms of technology (in that regard, the two games are substantially the same), but in terms of role-playing and adventure.

The sequel actually asks you to role-play — to make choices and to develop a certain style of character. You can be the thief, the diplomat or the warrior, depending on how you hone your skills. The choices you make during the game affect your character, and how others react. You can be a slaver, a drug dealer, a pimp (you can even sell your own wife), or you could play the saviour of the wastes, helping people where you can.

The central plot centres around a great drought that is affecting your village — a small collection of farms founded by the Vault Dweller (the character from Fallout 1) several generations ago. You, the Vault Dweller's descendant, must find the only thing with the power to save your village: the Garden of Eden Creation Kit.

There are too many side quests to mention, and, as with the original, there is a twist at the end. There are encounters aplenty, including special encounters

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(such as a bar filled with the cast of *Fallout* 1, a crashed shuttle from *Star Trek* and an exploded whale in the middle of the desert). Some of the characters from the original also make an appearance. Also watch out for the many pop culture references (including packets of Cheesy Poofs scattered around the wasteland). Be warned, though: this one is not for kids — the violence is extremely graphic and swearing is frequent.

All up, it's a great game, building brilliantly on the *Fallout* engine. *Fallout 2* is the RPG to buy at the moment — although make sure you download the patch, because the release version is full of bugs and has appalling load times.

Nathan Taylor

■ Distributor	Electronic Arts
■ Phone	(02) 9955 7744
■ Online	http://www.blackisle.com/
■ Price	\$89.95
■ Requires	Windows 95/98 or NT 4.0 SP3, Pentium 90, 16M RAM
■ Classification	MA 15+
■ Rating	★★★★☆

Grim Fandango

Another polished production from LucasArts, *Grim Fandango* is an adventure game in the style of *Day of the Tentacle* and the *Monkey Island Trilogy* — you can't die or get stuck, the solutions to puzzles have more to do with flair than lateral thinking, and puns and jokes are rampant.

Grim Fandango follows the story of Manny Calavera, travel agent for the Department of Death, collector of souls and agent for an underworld (literally) organisation which sends people on a four-year journey to the afterlife. Depending on how good they were in life, the journey can be difficult or hard. Manny discovers, however, some of his employer's shady acts, and goes on a quest to save a woman cheated out of her luxury trip to the afterlife on the Number Nine train. Manny's quest takes

him to a variety of locations in the underworld and his journey spans four years.

Grim Fandango has a new feature for LucasArts adventure games: a 3D engine — which will even take advantage of an accelerator if you have one. It is not, however, first person, and the backgrounds and rooms are pre-rendered with fixed camera points à la the *Alone in the Dark* series. Cut scenes are all handled seamlessly, the computer taking control for a few minutes while the plot advances.

I do have some criticisms. The humour in this particular package seems a bit strained, and it's not a terribly long game. And, like Sam and Max, a number of the puzzle solutions are rather foolish, with the only recourse a systematic 'try everything in my inventory, on every object I can access' style solution. Fortunately, these kinds of problems aren't too common, and most solutions are hinted at in the dialogue of Manny and the characters he speaks to.

In spite of these criticisms, it's a very good game, and should keep people who enjoyed previous LucasArts adventures amused until the next release.

Nathan Taylor



■ Distributor	Metro Playcorp
■ Phone	(03) 9329 2999
■ Online	http://www.lucasarts.com/
■ Price	\$89.95
■ Requires	Windows 95/98, Pentium 133, 32M RAM, 4x CD-ROM drive
■ Classification	G 8+
■ Rating	★★★☆☆

See <http://apcmag.com/holiday/> for our holiday games special. Reviews that will only appear on our Web site include *Delta Force*, *KKnD2 Krossfire*, *Gabriel Knight Mysteries*, *Populous: The Beginning*, *Red Baron 3D*, *Settlers III* and more.

Games News

● The groundbreakingly magnificent RPG *Fallout 2* has been on the shelves for quite a while now, but soon after the initial release of the game, lead programmer Tim Cain announced he was ready to begin work on his next project. It won't be with 'By Gamers For Gamers' Interplay, though, because Tim has left the building, along with the core team behind the *Fallout* series. Cain has formed his own company (Troika Studios) to begin work on the game he's "been waiting 15 years to make", and has signed a deal with Sierra Studios (because he can "trust" them, apparently) for the as-yet-unnamed project. Does this mean that *Fallout 1* and *2* were just warm-ups for his masterwork, then? If so, the future looks bright for Troika — and for us.

● Blizzard Entertainment has made a name for itself as one of the best development companies in the world, with releases including *Diablo*, *Warcraft*, and *Starcraft*. Blizzard was smart enough to include a mission editor with *Starcraft* for fans to make their own maps to share on the Internet — for free. Microstar Software commercially released an

expansion pack for *Starcraft* consisting of levels Microstar personnel had created with the mission editor. Blizzard took Microstar to court, and predictably enough won the case. Microstar was forced to recall its product from retailers and destroy all remaining copies of the package, as well as pay an undisclosed sum to Blizzard by way of reparation.

● Another small development company has bitten the dust. This time it's Crack Dot Com. The team was responsible for the vaguely successful *Abuse*, a 2D side-scrolling platform game, and had been working on a *Battle Zone*-esque game, *Golgotha*. The game had generated quite a bit of interest from the public, and looked like it could be very good. The great news is that it still could be, because Crack's owner, Dave Taylor, has released the source code and all the data associated with *Golgotha* for free via the Internet. Almost immediately, fans have developed a number of projects to finish the game, and <http://www.linuxgames.com/> is organising mailing lists for Linux, Mac OS, Windows and BeOS versions.

Gamespy

Like the real world, the Web's chock full of strange and wonderful places. And some weird ones too.

Coming to take me away

A New World

It could be argued that, prior to the discovery of ecommerce, the Web's *raison d'être* was promoting UFOs, cults and other 'alternative' theories. It could even be argued that without the Web there would be no 'X-Files', but that's probably taking things too far: there's a grand television tradition surrounding unexplained phenomena that stretches back through 'Great Mysteries of the World' via 'Project Blue Book', 'The Outer Limits' and 'The Twilight Zone'.

Despite this grand tradition, the Web's certainly responsible for propagating alternative theories, acting in some senses like one massive, disintermediated support group for those convinced that *all is not as it seems*. Although it's probably not the best UFO site online, nor even the most comprehensive, A New World is a good example of the genre, incorporating everything from UFO art to an abductee checklist.

The content is quite adequate to sustain either a true believer, a casual surfer or a sceptic after a laugh. Of all the material available on the site, however, it's the telepathic letter, dictated from an alien named Hilarion to a woman named Marge Ludeman and addressed to President Reagan, that's the most amusing.

In the letter, the Hilarion promises the usual UFO true believer guff: healing the world's ills, transcending human existence, and so forth. What's funny is that Hilarion chose to do it in rhyming couplets:

Dear President Reagan,

*And all those of earth's human race;
We are those who live in great ships far
beyond earth's troubled face.*



Your scientists must be taught a great many truths —

Truths of a kind from which they have stayed too long aloof.

Hilarion's poem illustrates the dilemma of a site like A New World: you either believe or you don't. If you're a believer, there's no problem, since you have the faith to sustain the complete lack of evidence for alien activity. If you're not a believer, you're without the faith and, like the scientists in the poem, choose to remain aloof from a great many truths.

Overall, one for fans . . . or wackos.

Josh Gliddon

■ Online <http://www.anw.com/>

■ Rating ★★★

Chick Publications

Web File wouldn't normally review a site containing a link labelled 'A Woman Rides the Beast', preferring to promote the same family values evident throughout the rest of the mag. But Chick Publications isn't a normal Web site, and the woman and beast aren't what you'd immediately think.

Chick Publications publishes, among other things, pithy little comic book tracts designed to encourage non-believers to convert to Christianity. There are plenty of organisations out there doing exactly the same thing: one notable example is the Children of God (AKA The Family — a pseudo-Christian sex cult), and its 'Flirty Fishing' comic books. Moonies and others all do exactly the same thing, so graphical conversion techniques don't really mark out Chick as anything special.

What sets it apart is Chick's track record, the particularly vicious nature of many of the tracts, and the millennial sensibility they contain. Chick Publications was founded by Jack T Chick back in the early 1970s to publish aids for Christian evangelists. Chick's early history isn't clear, and the site makes no real attempt to provide any clarity or context. For all intents and purposes, Chick is a mystery man.

Where Chick starts to get vicious is in both his characterisation of God as arbitrarily dividing people into the hell-bound



and the heaven-bound, and his obvious hatred of the Roman Catholic Church. It's this hatred that fuels statements such as the reference to a woman riding the beast, which, translated, means that the Catholic Church is working hand in hand with Satan (the Beast) to assure the collective downfall of humankind.

On a purely technical level, the site is well constructed and fast loading, especially considering that all the Chick Tracts are available for online viewing, free of charge. Chick's empire also stretches to videos, T-shirts and sales of third-party books, as well as the ubiquitous tracts and graphic novels; all can be purchased using its ecommerce facility. This was quite unexpected, really, given Chick's antipathy towards the cashless society and its links to the Beast. In fact, it's surprising that he's online at all.

Argus McPhee

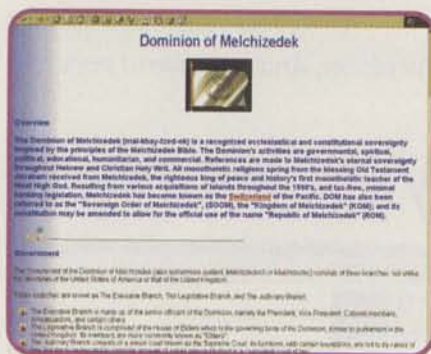
■ Online <http://www.chick.com/>

■ Rating ★★★★★

The Dominion of Melchizedek

"The Dominion of Melchizedek (mal-khay-tzed-ek) is a recognized ecclesiastical and constitutional sovereignty inspired by the principles of the Melchizedek Bible."

The real problem with this statement, which appears on the Dominion of Melchizedek's home page, is that the man who founded the highly dubious Dominion of Melchizedek, US citizen David Pedley, also wrote the Melchizedek bible. What he's done, effectively, is found his own country and his own religion. This is almost the same thing that the founding fathers of the US did, with two exceptions:



they were fleeing religious persecution, Pedley isn't; and North America is a real physical place, the Dominion of Melchizedek isn't. Instead, Pedley has staked his claim on the wide-open prairies of cyberspace.

The problem is, like the real world, cyberspace is a wild and woolly place where there's still no-one to hear you scream, especially when you are defrauded by someone that claims they're able to issue valid international passports, and you are charged five figures for the privilege. This is exactly what Pedley has been accused of doing.

What's funny, or scary, depending on how you look at it, is that some South-East Asian countries have actually fallen for it. Taiwan and Singapore reacted favourably to letters from the Dominion asking whether visa requirements would be waived for Dominion passport holders. Suffice to say, they back-pedalled pretty quickly when they twigged that there's no Dominion of Melchizedek on any map.

With this in mind, Pedley has not only rewritten the bible (admittedly heavily cribbed from the Christian Scientist's rewrite), but also started a university and created his own system of corporate law. There's even a stock exchange where Dominion-held shares and securities can be traded, as well as a bar association and international court of arbitration.

The Dominion even has its own satellite phone number (be warned, it'll cost you \$US10 per minute), and routes its mail through a post office box in Yarralumla, ACT.

The Dominion is a fascinating creation, and one that would have taken no small amount of time to build. However, the actual site construction is very basic HTML. It is robust, viewable almost everywhere, and about as unlikely to fall over as anything else online. Many people would find these qualities — stability, conservative government and more — reassuring in a real country, but the Dominion is not a real country. It will probably never

Surfband: Astronaut meets God

MUFON, immortalised in more than one 'X-Files' episode, is like a diving board placed above the deep pool of 'alternative thought' that is the Web. For the newbies out there, MUFON stands for Mutual UFO Network, and UFO, as you should already know, stands for Unidentified Flying Object.

The great thing about MUFON's site is that it doesn't attempt the same (il)logical leap made by so many other UFO sites. In other words, it doesn't automatically assume the existence of extraterrestrials simply because odd things are occasionally seen in the sky. Nor does it automatically assume the government experiments on humans, has advanced military technology, or is collaborating with aliens to enslave the world.

Enslaving the world may not be the explicit role of ECHELON, but advanced technology, coupled with keeping an eye on almost everyone on the planet, certainly is. ECHELON is posited to be an advanced supercomputer network, run by the US government and its allies, that is able to monitor virtually all electronic communication on the face of the planet. British Telecom's primary optic fibre backbones are even said to run through the British Headquarters associated with the project. The European Community got rather up in arms about this, and then suddenly went quiet. Free Congress (see link) has the most comprehensive information on this — still unproven — project.

Many fringe religious groups often cite government oppression to justify revolt, stockpiling and arms gathering. The tragic events at Waco, Texas, in which many Branch Davidians perished in fire, are often referred to as a key point in the aggression of a government against its people. The Electronic Waco Museum refers to eyewitness reports of a flame-throwing tank, the use of tear gas, and bulldozers piling up debris in front of the compound before the fire took hold.

Oklahoma City bomber Timothy McVeigh said that he'd been inspired to take action after the events at Waco. His actions, which destroyed the Federal Building in Oklahoma City, ultimately killed

more people than the fire in the Waco compound. It also heightened feelings of persecution within many fringe groups.

The Heaven's Gate believers didn't need government intervention to find their way to a higher state. Numerous Web sites document the Heaven's Gate site, including several complete mirrors at various places. More interesting, however, is the commentary that has sprung up around Heaven's Gate. One particular site (see link) has photographs that purport to show the space craft that was coming to collect the Heaven's Gate believers. This craft, trailing the comet Hale-Bopp, was supposed to be controlled by creatures that are a 'level

above human'. The comet was a marker to the Heaven's Gate believers that their time to ascend to the level above human was nigh, and that the earth was set to be 'recycled' in a cataclysmic event.

It's easy to be cynical about believers in extraterrestrials, especially since there seem to be very few people that could be

established as 'credible witnesses' coming forward, claiming alien abduction. But proof isn't everything, and even the most cynical will take delight in the myriad abduction stories to be found on the Web.

The Web thrives on the unknown because it's the perfect medium with which to spread 'non-verified' information. It does, in many ways, liberate people because it doesn't require individuals to provide information that can be verified: all you need is a little faith, a computer and a Web browser, as these links demonstrate:

MUFON <http://www.rutgers.edu/~mcgrew/mufon/mufon.html>

ECHELON <http://www.freecongress.org/ctp/echelon.html>

Branch Davidian [gopher://wiretap.spies.com/00/Library/Religion/Fringe/koreish.txt](http://wiretap.spies.com/00/Library/Religion/Fringe/koreish.txt), <http://www.mnsinc.com/SkyWriter/WacoMuseum/> (Warning: some content at this site will disturb some people).

Heaven's Gate

<http://anw.com/halebopp/heaven.htm>

StarFriends <http://www.eagle-net.org/starfriends/html/index2.htm>



be anything more than a scam vehicle for a questionable operator.

Deanne McIntosh

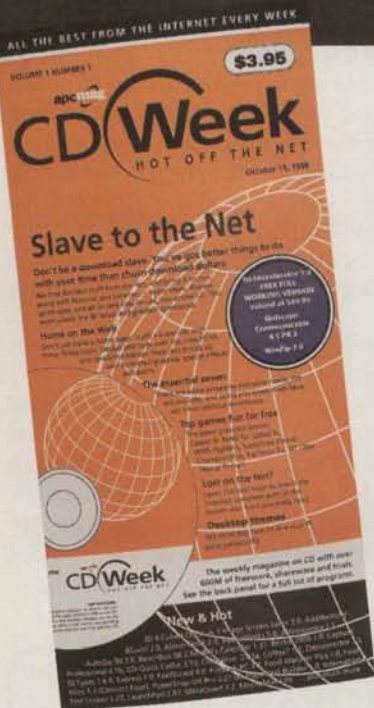
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Chip Chat

The colour debate

Last year, Chip Chat caused all sorts of shenanigans when we endlessly debated the revelation that brown was the new black. It seems those silly coots in the fashion world have been at it again. The 'word' is (and you'd want to believe us, after all we work in a building full of fashion magazines) that apparently silver is the new grey. We weren't aware that the old grey had gone away, but it nonetheless seems that silver is now doing whatever it is grey used to do.

This leaves us with just a few simple questions: does this mean people are going to start wearing CD-ROMs? Will PCs all now come in silver cases? And will 'grey power' be replaced by 'silver power'?

Managing nicely

Larry Ellison's \$1 million challenge to Microsoft for SQL 7.0 to outperform Oracle8 hasn't wended its way to Australia in quite the same form. Since its November launch, Microsoft Australia has been emphasising the new ease-of-use features, claiming that the product is so straightforward, even MDs could use it to make queries. However, the veracity of that claim came under fire at the press launch when genial MS head honcho Eugenio Beaufrand was heard to whisper, "I don't know whether *all* managing directors could use it".

Handy error messages part 52

The '404 File not found' error is a familiar one, but it seems the world is getting more creative with its online errors. Recently, an APC staffer tried to access the Digital Australia home page, only to be told the site could not be accessed because — and we quote — "the server threw an exception". What next? "The server chucked a total hissyfit".

Train in vain

Speaking of 'em, Compaq is really getting serious about killing off the Digital

brand. The latest switch is at Sydney's Rhodes railway station, which for many years has featured a prominent 'Alight here for Digital Computers' sign that's considerably larger than the actual station name. With budgets presumably approved, handypeople set about replacing the comfortably 1970s Digital logo with the Compaq insignia, eliminating another historic IT landmark.

The last laugh, however, goes to a graffiti artist who completely overwrote the logo with some kind of incomprehensible scrawl. The sign was hastily repainted in white, with only the original 'O' visible. Now, this never happened while the sign said 'Digital', which may tell you something. On the other hand, it may not.

Hot and sweaty

One of the more popular games in offices with Web access is to make up the name of potential porn sites at random and see if they exist. You simply pick a suitable phrase — let's say 'foxy chicks', for instance — and then type it in as a URL (<http://www.foxychicks.com/>). You get points for every site you come up with that hasn't already been registered by a porn-trepeneur (and yes, our example has already been taken).

If you want to add an extra element of challenge, you can try thinking up sites that could be pornographic, but prove not to be. We found one example at <http://www.wanton.com/>, but then we got bored. (Note: None of this is recommended for people under 18. Stop it now!) ■

Contest: Technology gag of the month

Let us apologise in advance. We didn't actually plan to have gags set in a toilet two months in a row, but sometimes life just turns out that way, OK? This month's winner comes from Rick Moon:

A bloke walks into a bar and sits down. He starts dialling numbers into his hand and talking into it. The barman walks over and tells him that this is a very tough area and he doesn't need any trouble.

The bloke says, "You don't understand, I'm very high-tech. I had a phone installed in my hand because I was tired of carrying around a mobile."

The barman says, "Prove it." The bloke dials up a number and hands his hand to the barman. The barman starts talking into the hand and carries on a conversation. "That's incredible," says the barman.

"Yeah," says the bloke, "I'm really very high-tech. I can keep in touch with my broker, my wife, you name it! By the way, where is the gents?"



The barman directs him to the gents. The bloke goes in and doesn't come out for a long time.

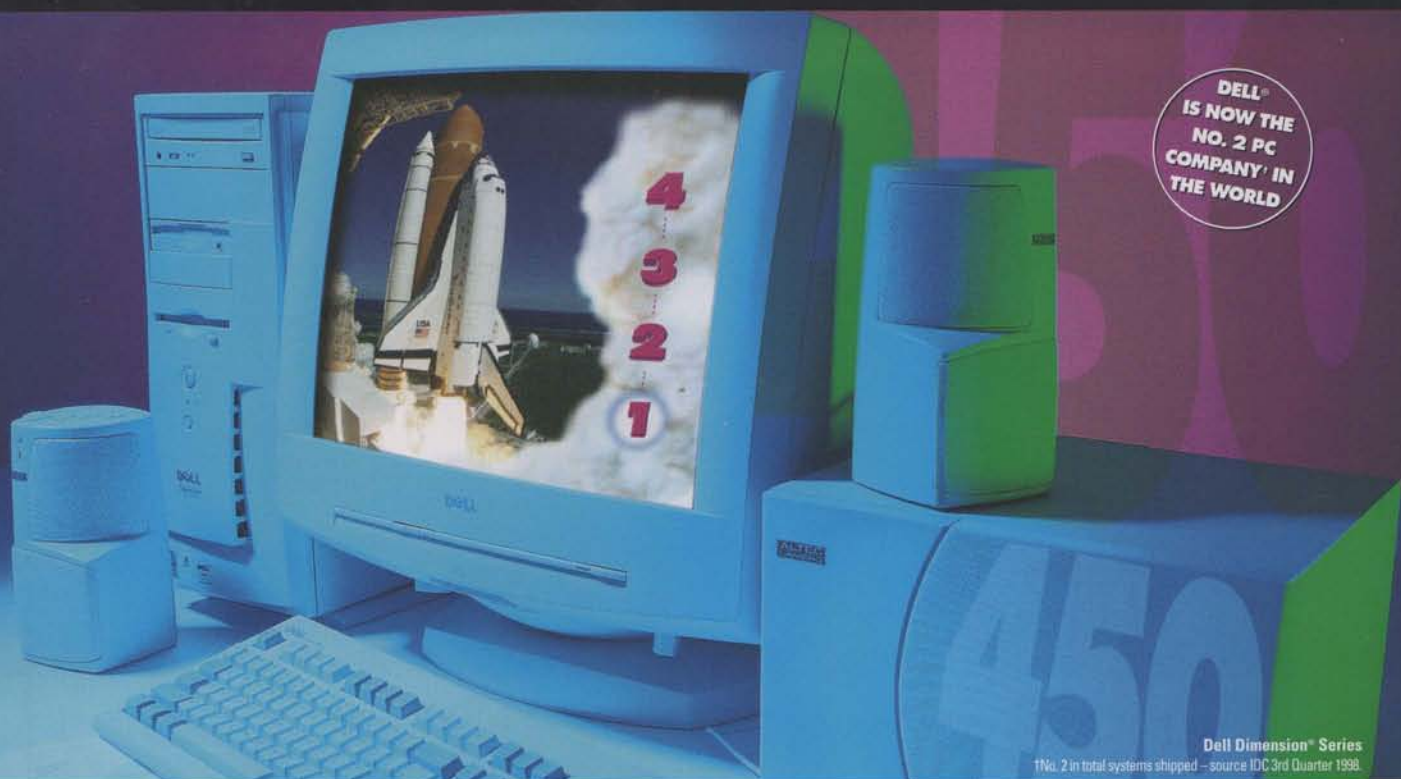
Fearing the worst given the tough area, the barman goes into the gents. The bloke is there and is spread-eagled on the wall. His pants are pulled down and he has a roll of toilet paper up his bum.

"Oh my god!" says the barman. "Did they rob you? How much did they get?"

The bloke turns and says, "No, no, I'm just waiting for a fax."

We'll be sending Rick a T-shirt from Epson, a Macromedia water bottle and a circular mousepad with the word 'Wang' on it. You could be next! Send your technology jokes to chipchat@acp.com.au — the shorter and funnier the better, and, again, enough with the Bill jokes already. If we publish your joke, you'll win a specially selected item from the APC prize cupboard. Go, go, go!

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